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Julie Zink

University of Dayton, jzink1@udayton.edu

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When Trade Secrecy Goes Too Far: Public Health and Safety Should Trump Corporate Profits

*Julie E. Zink**

ABSTRACT

This Article addresses the historical and ongoing use of trade secrets to withhold critical information from the public. Through its text and footnotes, the Article discusses the positives and negatives of trade secret protection; addresses historical and current examples of trade secret abuse; analyzes the inadequate solutions that have been tried and proposed; and, ultimately, recommends changing trade secret law by incorporating the precautionary principle into the definition of a trade secret to ensure that protection will no longer be available for information that endangers public health.

This Article is both timely and necessary, as the public is continually bombarded with new products about which critical information is withheld. In fact, an average of twenty new chemicals enter the marketplace each week. As a result, unknowing humans are acting as test subjects while companies, secreting away important information about the products' impact on public health, rake in record profits. Drawing lessons from decades of past injuries, it is past time for the United States to borrow from our European neighbors and incorporate the precautionary principle into US trade secret law. Doing so will allow for protection of trade secrets while also maintaining public health. This Article provides a useful proposal for academics, legislators, courts, and practitioners to consider as they contend with the increased use of trade secrets and the numerous health hazards caused by trade secret products and processes.

* Professor of Lawyering Skills, University of Dayton School of Law (UDSL). As part of UDSL's Program in Law & Technology, the Author has taught Intellectual Property Law, Trade Secret Law, and Patent Litigation. The Author also teaches courses on legal research and writing. The Author wishes to thank Marci Hunnicut and David Bailey for their research assistance, and her former and current colleagues Katherine Early and Dalindyabo Shabalala for their valuable comments. The Author also wishes to thank the faculty members who provided feedback during her presentation of this article topic at UDSL's Faculty Colloquium Series.

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I. INTRODUCTION

While there are positives to trade secret protection, such protection should not be available when a trade secret causes harm to public health and safety. Given the historical abuses committed by corporations in the name of trade secrecy and the lack of measures to effectively curtail such abuses, it is time to revise trade secret law to ensure history does not continue to repeat itself. Companies should no longer be permitted to hide behind the shield of trade secrets and withhold information that negatively impacts public health and safety. To accomplish this goal, US trade secret law should incorporate the European precautionary principle; doing so will shift the burden to the trade secret owner to prove that its asserted trade secret does not endanger public health. Once that burden is met, trade secret protection will be available. If, however, the burden cannot be met, then the asserted secret should be revealed as a matter of public health and safety.

Part II of this Article discusses the positive societal effects associated with the protection of trade secrets. Conversely, Part III points out that secrecy also has some innate dangers. Next, Part IV addresses historical examples of such abuses, while Part V discusses some current examples. Part VI then explains that, unfortunately, neither the legislative nor the judicial branches have been able to

solve this dilemma of trade secret abuses. Several possible solutions or partial solutions have been offered, and those suggestions are covered in Part VII. However, none of the solutions adequately balance the interests of the trade secret owners with those of the public. Therefore, Part VIII lays out a proposal to revise the law by incorporating the precautionary principle into the definition of a trade secret.

II. THE BENEFITS OF PROTECTING TRADE SECRETS

In *Secrets: On the Ethics of Concealment and Revelation*, US philosopher and ethicist Sissela Bok acknowledges that not all secrecy is intended to deceive or cause harm.¹ Rather, some “secrecy is invoked to protect what one owns.”² For instance, protecting the knowledge one has gathered or developed is often essential to launching or maintaining a successful business.³ This is true whether the information is technical in nature or business related.⁴ If the process for creating a particular product is unknown by all but one company, then having such information gives that company an advantage over competitors.⁵ Likewise, if a company devotes its time, energy, and money to collecting information on its customers (e.g., preferred product specifications, pricing data, or points of contact), that company would not want to make such information available to its competitors.⁶ In this regard, “American businesses own an estimated \$5 trillion dollars of trade secrets.”⁷

1. SISSELA BOK, *SECRETS: ON THE ETHICS OF CONCEALMENT AND REVELATION* 7 (Vintage Books 1989) (1983). Sissela Bok, the daughter of two Nobel Prize winners, received her Ph.D. in philosophy from Harvard in 1970. *See id.* at 334; *see also* Judy Klemesrud, *Sissela Bok: A View of Life and Ethics*, N.Y. TIMES, Mar. 6, 1983, at 66, www.nytimes.com/1983/03/06/style/style-sissela-bok-a-view-of-life-and-ethics.html [<https://perma.cc/5DKJ-74N7>]. Formerly a Professor of Philosophy at Brandeis University, she is currently a Senior Visiting Fellow at the Harvard School of Public Health. *Faculty Members*, HARV. T.H. CHAN SCH. PUB. HEALTH, <https://www.hsph.harvard.edu/population-development/about-us/people/faculty/#B> [<https://perma.cc/4UV8-YD8S>] (last visited Mar. 31, 2018).

2. BOK, *supra* note 1, at 24.

3. *See id.* at 139 (“Incentives are strong to be the sole beneficiary of a process unknown to competitors . . .”).

4. *See id.*; *see also* ROGER M. MILGRIM, *MILGRIM ON TRADE SECRETS* § 1.01 (2017) (“The definition of trade secret is thus unlimited as to any particular class or kind of matter . . .”).

5. *See* MILGRIM, *supra* note 4.

6. *See id.*

7. Hakeem Jeffries et al., *Why Protecting Our Trade Secrets Is Essential to Saving the Economy*, BUS. INSIDER (Aug. 18, 2014, 12:15 PM), http://www.businessinsider.com/protecting-our-trade-secrets-is-essential-for-the-economy-2014-8?pt=385758&ct=Sailthru_BI_Newsletters&mt=8&utm_source=Triggermail&utm_medium=email&utm_campaign=email_article [<https://perma.cc/L6ZZ-CZEQ>].

While some companies protect their technical information by obtaining patent protection on their inventions, others choose not to do so.⁸ First, many inventions may not be patentable, and if success is not likely, then companies make the decision to not disclose the information or spend the hefty fees associated with drafting and filing a patent application.⁹ Second, it is much cheaper to maintain a trade secret than to file for a patent, and patent infringement suits are less likely for plaintiffs to win.¹⁰

Trade secrecy provides a measure of security to the owners of such information, and compared to many other types of legal protection, it is generally not difficult or expensive to meet the required elements under the law.¹¹ Information will be protected as a trade secret if a person or entity (1) has specific information that (2) has independent economic value (actual or potential), (3) which is not generally known or readily ascertainable, and (4) has been protected by reasonable secrecy measures.¹² *All* of these elements must be proven in order to obtain trade secret protection.¹³

8. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 487–88 (1974).

9. See, e.g., *id.* at 487; BOK, *supra* note 1, at 140.

10. BOK, *supra* note 1, at 140 (“About half of all lawsuits brought to defend trade secrets are decided in favor of the plaintiffs, but less than 30 percent of patent-infringement suits are decided in favor of the patent owners. As a result, companies are resorting more often to trade secrecy, even when patenting is a possibility.”); see also *Kewanee Oil*, 416 U.S. at 482–83.

11. See R. Mark Halligan, *Trade Secrets v. Patents: The New Calculus*, LANDSLIDE, July–Aug. 2010, at 1, 1–2 (“[P]atents are harder to get and harder to defend.”); Derek Handova, *The Business of IP: Choosing Between Patents and Trade Secrets*, IPWATCHDOG (May 25, 2016), <http://www.ipwatchdog.com/2016/05/25/choosing-patents-and-trade-secrets/id=69368/> [<https://perma.cc/Y4RJ-TDQM>] (“Patents cost tens of thousands of dollars while trade secret protection is essentially free . . . [W]ith trade secrets there is no need to comply with formalities or any formal process. And as a result, they can take immediate effect, with no significant procedures or costs associated with their creation . . .”).

12. See 18 U.S.C. § 1839(3) (2012). The Defend Trade Secrets Act of 2016 defines the term “trade secret” as encompassing

all forms and types of financial, business, scientific, technical, economic, or engineering information, including patterns, plans, compilations, program devices, formulas, designs, prototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing if—(A) the owner thereof has taken reasonable measures to keep such information secret; and (B) the information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable through proper means by, another person who can obtain economic value from the disclosure or use of the information.

Defend Trade Secrets Act of 2016, Pub. L. No. 114-153, 130 Stat. 376 (2016) (codified in scattered sections of 18 U.S.C.); see 18 U.S.C. § 1839(3). A similar definition is found in the Uniform Trade Secrets Act, which has been adopted by forty-seven states. See UNIF. TRADE SECRETS ACT § 1(4) (amended 1985), 14 U.L.A. 538 (2005); *Acts: Trade Secrets Act*, UNIF. L. COMMISSION,

In terms of the “information” component, all forms and types of information are potentially protectable, whether tangible or intangible.¹⁴ The only limitation is that the claimed information must not be a vague or abstract concept.¹⁵ The owner must be able to articulate with specificity what it is claiming to be a trade secret.¹⁶

As to the “independent value” component, the trade secret owner must show that the information has “actual or potential” value.¹⁷ While use of the trade secret was originally required in order to obtain protection, that ceased with the adoption of the Uniform Trade Secrets Act’s (UTSA’s) definition of a trade secret, which discarded the *Restatement of Torts*’ use requirement.¹⁸ Thus, information has “potential” value even if there is no product or process utilizing the information.¹⁹ Courts determine whether value is present by examining the competitive advantage the information provides to the owner or the advantage it would provide to the owner’s competitors, as well as the amount of effort or money expended by the owner in developing the information.²⁰

The “not generally known or readily ascertainable” component essentially requires that the information be secret.²¹ To determine whether this element is met, courts consider the extent to which the information is known outside of the owner’s business and the ease or difficulty with which the information could be properly acquired or duplicated by others.²²

Finally, the “reasonable secrecy measures” component requires that the owner take affirmative steps to protect the information.²³

<http://www.uniformlaws.org/Act.aspx?title=trade%20Secrets%20Act> [https://perma.cc/MPD5-THPY] (last visited Mar. 31, 2018).

13. See 18 U.S.C. § 1839(3); UNIF. TRADE SECRETS ACT § 1(4).

14. 18 U.S.C. § 1839(3); UNIF. TRADE SECRETS ACT § 1(4).

15. See *SL Montevideo Tech., Inc. v. Eaton Aero, LLC*, 491 F.3d 350, 351–52 (8th Cir. 2007); *Triple Tee Golf, Inc. v. Nike, Inc.*, 485 F.3d 253, 264 (5th Cir. 2007); *Big Vision Private Ltd. v. E.I. DuPont De Nemours & Co.*, 1 F. Supp. 3d 224, 258 (S.D.N.Y. 2014) (holding that a vague and indefinite piece of information cannot be protected).

16. See *Nilssen v. Motorola, Inc.*, 963 F. Supp. 664, 673 (N.D. Ill. 1997).

17. 18 U.S.C. § 1839(3) (emphasis added); UNIF. TRADE SECRETS ACT § 1(4)(i).

18. See MILGRIM, *supra* note 4, § 1.01 (“The UTSA substantive aspect closely parallels the 1939 *Restatement* definition *except* that the UTSA has no requirement that, to be protected, information must be used in one’s trade or business.”).

19. See *id.*; see also 18 U.S.C. § 1839(3)(B); UNIF. TRADE SECRETS ACT § 1(4)(i).

20. See, e.g., *Learning Curve Toys, Inc. v. Playwood Toys, Inc.*, 342 F.3d 714, 722, 726–28 (7th Cir. 2003).

21. 18 U.S.C. § 1839(3)(B); UNIF. TRADE SECRETS ACT § 1(4)(i); see MILGRIM, *supra* note 4, § 1.03.

22. See, e.g., *Learning Curve Toys*, 342 F.3d at 722.

23. See *Incase Inc. v. Timex Corp.*, 488 F.3d 46, 53 (1st Cir. 2007); see also *Learning Curve Toys*, 342 F.3d at 722.

While the measures need not be perfect or even ultimately successful, the owner cannot merely sit back and do nothing.²⁴ Thus, courts consider the extent to which the information is known by employees and others involved in the owner's business, as well as the measures taken by the owner to guard the secrecy of the information from outside parties.²⁵

According to Sissela Bok, "[t]rade secrets are [c]ompany assets. They were developed at great expense and only after long periods of experimentation."²⁶ Under John Locke's labor theory of property, people have a right to what they have made.²⁷ Protecting trade secrets encourages continued investment and innovation,²⁸ helps to maintain commercial ethics,²⁹ and allows for protected disclosure of the information to partners and employees.³⁰

However, trade secret protection can be lost in the blink of an eye.³¹ It takes little time to copy large amounts of information,³²

24. See *Rockwell Graphic Sys., Inc. v. DEV Indus., Inc.*, 925 F.2d 174, 179–80 (7th Cir. 1991); see also *E. I. duPont deNemours & Co. v. Christopher*, 431 F.2d 1012, 1017 (5th Cir. 1970) ("[A]n impenetrable fortress is an unreasonable requirement . . ."); *Dicks v. Jensen*, 768 A.2d 1279, 1284 (Vt. 2001).

25. See, e.g., *Learning Curve Toys*, 342 F.3d at 722.

26. BOK, *supra* note 1, at 146.

27. JOHN LOCKE, *THE SECOND TREATISE OF CIVIL GOVERNMENT AND A LETTER CONCERNING TOLERATION* § 27 (J.W. Gough ed., Basil Blackwell 1948) (1689) ("Whatsoever, then, he removes out of the state that nature hath provided and left it in, he hath mixed his labour with, and joined to it something that is his own, and thereby makes it his property."); see BOK, *supra* note 1, at 143 ("[A] view of property expressed most forcefully by Locke [is] that individuals have a right to what they have made, joined their labor to, or worked to wrest from nature."); Michael Risch, *Why Do We Have Trade Secrets?*, 11 MARQ. INTELL. PROP. L. REV. 1, 28–33 (2007) (discussing the influence of Lockean theory on trade secret protection).

28. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974); see also BOK, *supra* note 1, at 147–48.

29. See *Kewanee Oil*, 416 U.S. at 481–82; MILGRIM, *supra* note 4, § 1.01.

30. See *Kewanee Oil*, 416 U.S. at 485–86 (stating that if trade secret protection were unavailable, "[s]ecurity precautions necessarily would be increased, and salaries and fringe benefits of those few officers or employees who had to know the whole of the secret invention would be fixed in an amount thought sufficient to assure their loyalty. Smaller companies would be placed at a distinct economic disadvantage . . ." (footnote omitted)); MILGRIM, *supra* note 4, § 1.01 ("[R]easonable use of a trade secret including controlled disclosure to employees and licensees is consistent with the requirement of relative secrecy."); ELIZABETH A. ROWE & SHARON K. SANDEEN, *CASES AND MATERIALS ON TRADE SECRET LAW* 1 (2012) ("If the requirements of trade secret law are met, the holder of an idea or other bit of information can share it with others without losing legal protection. In this way, trade secret law is believed to encourage innovation, invention, and creativity and to facilitate the sharing of information.").

31. See BOK, *supra* note 1, at 144–45 ("Unlike most forms of property, trade secrets are of an ephemeral nature. They may be lost merely from being photographed or even seen; they may evaporate as a result of someone's facial expression at the moment one guesses at a formula. Controls over exclusivity, permanence, and transmissibility are more fragile for trade secrets than for other property; unusual secrecy is therefore needed to guard them.").

especially in the digital age.³³ Previously, trade secret information could be protected by locking it in a safe or filing cabinet behind a locked office door inside a secure building.³⁴ Now a trade secret can be lost within seconds.³⁵ Nearly everyone is carrying a cell phone that allows them to record sounds, snap pictures, and take videos; employees can email files to themselves (or others), download files to a removable drive that can be easily carried off-site, or upload files to the cloud;³⁶ angry ex-employees can anonymously publish company trade secrets online; operators can maneuver drones to peer inside property;³⁷ and hackers can gain access to a company's computer system from down the street or from the other side of the globe.³⁸ Each year, roughly \$300 billion of trade secrets are stolen from US businesses.³⁹ As a result, the need for new technologically evolving and tighter secrecy measures has grown.⁴⁰

32. See *id.* at 148 (“To develop new processes and achieve new knowledge in industry takes time and often great resources; to copy them, very little.”).

33. See Elizabeth A. Rowe, *Contributory Negligence, Technology, and Trade Secrets*, 17 GEO. MASON L. REV. 1, 21–22 (2009).

34. See MILGRIM, *supra* note 4, § 1.04 (citing *State ex rel. Luken v. Corp. for Findlay Mkt. of Cincinnati*, 988 N.E.2d 546, 552 (Ohio 2013); *McClain v. State*, 269 S.W.3d 191, 196 (Tex. Ct. App. 2008)).

35. See Elizabeth A. Rowe, *Saving Trade Secret Disclosures on the Internet Through Sequential Preservation*, 42 WAKE FOREST L. REV. 1, 3–4 (2007) (noting the Internet “facilitates complete destruction of a trade secret in an instant”); Michael H. Bunis & Anna Dray-Siegel, *You Need to Work Harder to Fight Trade Secret Theft*, LAW360 (Aug. 7, 2013, 12:38 PM), https://www.choate.com/uploads/1178/doc/Bunis,_Dray-Siegel_-_Law360_-_You_Need_To_Work_Harder_To_Fight_Trade_Secret_Theft.pdf [https://perma.cc/5C4S-HC3R] (“[A]n electronically stored trade secret can be stolen with little more than the click of mouse [sic], particularly if an employee already has access to trade secret information. An employee intent on stealing trade secret information may send it using a Web-based personal email account, download it to a personal USB drive, or upload it to a community or public cloud, all without alerting his or her employer.”).

36. See *Riley v. California*, 134 S. Ct. 2473, 2484, 2489 (2014); Jenna M. Andrews, Note, *An Inside Job: The Intersection of Federal Computer Law and Trade Secret Law in Cases of Insider Misappropriation*, 18 J. HIGH TECH. L. 161, 176 (2017); see also Bunis & Dray-Siegel, *supra* note 35 (“Use of . . . cloud computing infrastructures such as Dropbox[] creates additional opportunities for determined employees to disclose or send trade secret information outside of the organization.”).

37. See Declan McCullagh, *Technology as Security*, 25 HARV. J.L. & PUB. POL’Y 129, 138–39 (2001); Wayne Bond, *Drones & Trade Secrets—How Low Can They Go?*, SEYFARTH SHAW: TRADING SECRETS (May 9, 2016), <http://www.tradesecretslaw.com/2016/05/articles/trade-secrets/drones-trade-secrets-how-low-can-they-go/> [https://perma.cc/85RC-ZVNP].

38. See Elizabeth A. Rowe, *Rats, Traps, and Trade Secrets*, 57 B.C. L. REV. 381, 381–82 (2016) (“Technology has facilitated both the amount of trade secrets that are now stored electronically, and the rise of cyber intrusions.”).

39. Jeffries et al., *supra* note 7.

40. See EXEC. OFFICE OF THE PRESIDENT, ADMINISTRATION STRATEGY ON MITIGATING THE THEFT OF U.S. TRADE SECRETS 1 (2013), <https://www.justice.gov/criminal->

III. THE NEGATIVES OF SECRECY

Not surprisingly, there are also negatives involved in protecting trade secrets—namely, providing a legal shield that corporations can use to conceal nefarious activities. According to Bok, “[t]rade secrecy is the most frequent claim made by those who want to protect secrets in business”; corporations may assert such claims to protect legitimate secrets and, in some cases, to abuse or exploit their trade secret protections.⁴¹

Trade secrecy can cause harm. First, trade secrecy does not always promote one of its stated policy goals—innovation.⁴² Rather, it encourages companies to engage in duplicative investment in research and development.⁴³ It also frustrates the disclosure goals of the patent system when companies opt for trade secrecy rather than patent protection.⁴⁴

ccips/file/938321/download [https://perma.cc/7Z6M-RKL5] (“Emerging trends indicate that the pace of economic espionage and trade secret theft against U.S. corporations is accelerating Trade secret theft threatens American businesses, undermines national security, and places the security of the U.S. economy in jeopardy.”).

41. BOK, *supra* note 1, at 136.

42. See CLAIRE HOPE CUMMINGS, UNCERTAIN PERIL: GENETIC ENGINEERING AND THE FUTURE OF SEEDS 81–82 (2008) (“Private property rights are fundamental to our economic system, and they have extended their reach into every aspect of our lives. . . . It has gone too far, however, and the overuse of intellectual property rights is stifling innovation. . . . When research was being conducted openly and in the public interest, it was shared by publication. But now intellectual property rights and patents constrict this activity and limit what is studied.”).

43. See 18 U.S.C. § 1839(3)(B) (2012). Trade secrets are not “generally known” or “readily ascertainable” by others. *See id.* If kept secret, then the trade secret can last forever. *See id.* Unlike patents, which require dissemination of information in exchange for a limited monopoly, *see* U.S. CONST. art. I, § 8; J.E.M. Ag Supply, Inc. v. Pioneer Hi-Bred Int’l, Inc., 534 U.S. 124, 142 (2001), trade secret owners are required to prevent disclosure of the claimed information, *see* 18 U.S.C. § 1839(3)(B); Kewanee Oil Co. v. Bicron Corp., 416 U.S. 470, 484–85 (1974); UNIF. TRADE SECRETS ACT § 1(4) (amended 1985), 14 U.L.A. 538 (2005). Given that independent creation and reverse engineering of trade secret information are permitted, companies in the same discipline often spend valuable resources trying to create the same information, which results in duplication of investment. *See* UNIF. TRADE SECRETS ACT § 1 cmt. In fact, it is possible for two companies to independently develop the same trade secret information. *See* E. I. du Pont de Nemours & Co. v. United States, 288 F.2d 904, 911 (Ct. Cl. 1961); Fishkin v. Susquehanna Partners, G.P., 563 F. Supp. 2d 547, 582 (E.D. Pa. 2008). Doing so does not destroy the trade secret, as long as disclosure does not occur. *See Fishkin*, 563 F. Supp. 2d at 582. Rather, those companies are independent owners of the same trade secret. *See du Pont*, 288 F.2d at 911.

44. See BOK, *supra* note 1, at 140 (“[C]ompanies are resorting more often to trade secrecy, even when patenting is a possibility.”); *see also Kewanee Oil*, 416 U.S. at 486–87, 489 (“The interest of the public is that the bargain of 17 years of exclusive use in return for disclosure be accepted. If a State, through a system of protection, were to cause a substantial risk that holders of patentable inventions would not seek patents, but rather would rely on the state protection, we would be compelled to hold that such a system could not constitutionally continue

Second, secrecy debilitates judgment.⁴⁵ If only a select few know the trade secret, then they are the only ones who can make decisions regarding the information at issue. This postpones discovery of errors and effectively shuts out criticism from others who may be able to provide valuable feedback.⁴⁶ As a result, faulty assumptions about risk may mean that little to no deliberation takes place regarding whether to continue, modify, or cease use of the trade secret.⁴⁷

Third, secrecy has the capacity to corrupt and to invite abuse.⁴⁸ Due to others' lack of knowledge regarding the trade secret, those with knowledge operate in a system free from oversight.⁴⁹ This lack of accountability coupled with the desire for higher profits (for which they *are* held accountable) results in a loosening of moral constraints.⁵⁰ When no one is present to hold a mirror up to their faces, they can downplay the consequences of their actions and disregard any negative impacts the trade secret may have on their employees, their consumers, the general public, or the environment.

to exist."); Andrew A. Schwartz, *The Corporate Preference for Trade Secret*, 74 OHIO ST. L.J. 623, 624 (2013).

45. BOK, *supra* note 1, at 25 ("Secrecy can harm those who make use of it in several ways. It can debilitate judgment, first of all, whenever it shuts out criticism and feedback, leading people to become mired down in stereotyped, unexamined, often erroneous beliefs and ways of thinking. Neither their perception of a problem nor their reasoning about it then receives the benefit of challenge and exposure. Scientists working under conditions of intense secrecy have testified to its stifling effect on their judgment and creativity.").

46. *See id.* at 26 ("[S]ecrecy can hamper the exercise of rational choice at every step: by preventing people from adequately understanding a threatening situation, from seeing the relevant alternatives clearly, from assessing the consequences of each, and from arriving at preferences with respect to them.").

47. *See id.* at 196 ("[Secrecy] thwarts reasoning: it limits the perception of problems and of alternative ways to approach them, prevents adequate deliberation, and deflects critical feedback, thus restricting choice and decision.").

48. *See id.* at 123 ("Confidentiality, like all secrecy, can then cover up for and in turn lead to a great deal of error, injury, pathology, and abuse."); *id.* at 166 ("[M]ilitary secrecy . . . insulates from criticism and feedback, and thus opens the door to abuse . . ."); Wendy E. Wagner, *Commons Ignorance: The Failure of Environmental Law To Produce Needed Information on Health and the Environment*, 53 DUKE L.J. 1619, 1645, 1701 (2004) ("Using broad trade secret protections, manufacturers impede public access to a large body of information regarding their manufacturing processes, testing data, and the contents of their toxic products and waste streams. . . . Firms that are unenthusiastic about granting public access to information on the harms created by their products and activities face few restraints in abusing these generous trade secret protections.").

49. *See* David S. Levine, *Secrecy and Unaccountability: Trade Secrets in Our Public Infrastructure*, 59 FLA. L. REV. 135, 189 (2007) ("[T]rade secrecy by its very definition abhors both transparency and public accountability.").

50. *See* BOK, *supra* note 1, at 173 ("To the extent that rulers become convinced of their rightful freedom from oversight and from ordinary moral constraints, they grow predictably more corrupt and exploitative.").

IV. HISTORICAL EXAMPLES OF TRADE SECRETY ABUSE

Corporations assert trade secrecy for a number of reasons,⁵¹ some of which are improper. For decades, companies have been introducing new products, such as cigarettes,⁵² asbestos fibers,⁵³ pesticides (namely, DBCP),⁵⁴ and lead paint⁵⁵ into the market. The

51. See *id.* at 147 (“[C]orporations conceal their activities and especially their plans from many others: from shareholders who might question investments and links to other companies; from the government, in order to avoid interference and the publicity that may surround information once it is given over into the government’s hands; from consumers, in order not to lose business; and from employees about such matters as hidden dangers at the workplace, imminent relocation plans, and risks of bankruptcy.”).

52. See CLIVE BATES & ANDY ROWELL, WORLD HEALTH ORG., TOBACCO EXPLAINED: THE TRUTH ABOUT THE TOBACCO INDUSTRY . . . IN ITS OWN WORDS 1, <http://www.who.int/tobacco/media/en/TobaccoExplained.pdf> [<https://perma.cc/PBL3-4RN2>] (last visited Apr. 19, 2018); NORBERT HIRSCHHORN, WORLD HEALTH ORG., THE TOBACCO INDUSTRY DOCUMENTS: WHAT THEY ARE, WHAT THEY TELL US, AND HOW TO SEARCH THEM 5, http://www.who.int/tobacco/communications/TI_manual_content.pdf [<https://perma.cc/DJ22-ASQK>] (last visited Mar. 14, 2018) (“In 1998, six million once secret documents from seven cigarette manufacturers doing business in the US became available to the public as a result of legal action.”); Ryan Jaslow, *Big Tobacco Kept Cancer Risk in Cigarettes Secret: Study*, CBS NEWS (Sept. 30, 2011, 12:18 PM), <http://www.cbsnews.com/news/big-tobacco-kept-cancer-risk-in-cigarettes-secret-study/> [<https://perma.cc/2ANM-X888>] (“New research suggests that tobacco companies have known for 40 years that cigarette smoke contains cancer-causing particles, but deliberately hid the information from the public.”).

53. See DANIEL STEEL, PHILOSOPHY AND THE PRECAUTIONARY PRINCIPLE: SCIENCE, EVIDENCE, AND ENVIRONMENTAL POLICY 71 (2014) (“Reports of harmful effects of asbestos on lungs date to 1898.”); Lorraine Mallinder, *Deadly Secret: A 1940s Whistle-Blower Uncovers Hidden Evidence Linking Asbestos to Cancer*, CAN.’S HIST., Apr.–May 2011, at 33, 33–38, <https://mallinder.files.wordpress.com/2011/05/asbestos.pdf> [<https://perma.cc/WRU4-CS3G>] (regarding similar secrecy tactics in Canada); Jim Morris, *Facing Lawsuits Over Deadly Asbestos, Paper Giant Launched Secretive Research Program*, CTR. FOR PUB. INTEGRITY (May 19, 2014, 12:19 PM), <https://www.publicintegrity.org/2013/10/21/13559/facing-lawsuits-over-deadly-asbestos-paper-giant-launched-secretive-research> [<https://perma.cc/CR32-CK9M>]; Bill Richards, *New Data on Asbestos Indicate Cover-Up of Effects on Workers*, WASH. POST (Nov. 12, 1978), https://www.washingtonpost.com/archive/politics/1978/11/12/new-data-on-asbestos-indicate-cover-up-of-effects-on-workers/028209a4-fac9-4e8b-a24c-50a93985a35d/?utm_term=.30acab7443fc [<https://perma.cc/P3NS-NDHU>] (“Documents uncovered in a series of recent lawsuits indicate that for more than three decades the nation’s largest asbestos companies hid evidence about potentially fatal effects of asbestos exposure on millions of U.S. workers.”).

54. See *Trade Secrets: A Moyers Report* 56:50–57:29 (PBS television broadcast, Moyers & Co. 2001), <http://billmoyers.com/content/trade-secrets/> [<https://perma.cc/2G4E-76XK>]. For access to the transcript, see *Trade Secrets: A Moyers Report Program Transcript*, PBS, <http://www.pbs.org/tradesecrets/transcript.html> [<https://perma.cc/K27A-9VR9>] (last visited Apr. 1, 2018). Around 1977, the public learned that 1,2-Dibromo-3-chloropropane (DBCP), which Dow, Occidental, and Shell all produced, is “a reproductive toxicant, a very powerful carcinogen.” See *Trade Secrets: A Moyers Report*, *supra*, at 54:02–58:21; see also EPA, 1, 2-DIBROMO-3-CHLOROPROPANE (DBCP) (2000), <https://www.epa.gov/sites/production/files/2016-09/documents/1-2-dibromo-3-chloropropane.pdf> [<https://perma.cc/72RU-Y5QV>] (citing NAT’L CTR. FOR EVNTL. ASSESSMENT, EPA, INTEGRATED RISK INFORMATION SYSTEM (IRIS): 1, 2-DIBROMO-3-CHLOROPROPANE (DBCP) (1991), https://cfpub.epa.gov/ncea/iris/iris_documents/documents/

public later discovered that these products were dangerous. For decades, however, companies used trade secrecy to conceal the dangerous aspects of their products.⁵⁶ The following examples—perfluorooctanoic acid (PFOA), vinyl chloride, and benzene—merely scratch the surface of companies’ use of trade secrets to hide known health dangers from the public.⁵⁷

A. Perfluorooctanoic Acid

In 1951, the chemical company DuPont began purchasing PFOA, a man-made biopersistent and bioaccumulative chemical, from the 3M Company to aid in its manufacture of Teflon, a nonstick

subst/0414_summary.pdf [https://perma.cc/FRX4-5Y7W]); *Trade Secrets: A Moyers Report*, *supra*, at 56:24–56:49 (narrating a Dow Chemical Research Laboratory memorandum from July 23, 1958: “Testicular atrophy may result from prolonged repeated exposure. A tentative hygiene standard of 1 part per million is suggested.”); *id.* at 57:56–58:16 (narrating an Occidental interoffice memorandum from April 29, 1975: “We are slowly contaminating all wells in our area and two of our own wells are contaminated to the point of being toxic to animals or humans. THIS IS A TIME BOMB THAT WE MUST DE-FUSE.”).

55. See GERALD MARKOWITZ & DAVID ROSNER, *DECEIT AND DENIAL: THE DEADLY POLITICS OF INDUSTRIAL POLLUTION* 88–91 (2013) (discussing secret internal documents which reveal that the lead paint industry knew the dangers that lead caused decades before the public’s discovery); Luke Broadwater, *Advocates Say Lead Paint Industry Should Be Held Liable in Poisoning of Baltimore Children*, *BALT. SUN* (Feb. 27, 2016, 4:14 PM), <http://www.baltimoresun.com/news/maryland/sun-investigates/bs-md-ci-lead-poisoning-20160227-story.html> [https://perma.cc/DDH9-MNE5] (“The paint industry knew about the dangers of lead, and they still sold lead-based paint to the public.”).

56. See BOK, *supra* note 1, at 146; see also Jaslow, *supra* note 52; Kristen Lombardi, *Benzene and Worker Cancers: ‘An American Tragedy’*, *CTR. FOR PUB. INTEGRITY* (Dec. 7, 2014, 3:37 PM), <https://www.publicintegrity.org/2014/12/04/16320/benzene-and-worker-cancers-american-tragedy> [https://perma.cc/9FBU-X2Z2]; Morris, *supra* note 53; Nathaniel Rich, *The Lawyer Who Became DuPont’s Worst Nightmare*, *N.Y. TIMES MAG.* (Jan. 6, 2016), http://www.nytimes.com/2016/01/10/magazine/the-lawyer-who-became-duponts-worst-nightmare.html?_r=0 [https://perma.cc/KUT8-9G4H]; *Trade Secrets: A Moyers Report*, *supra* note 54, at 10:57–11:36.

57. See STEEL, *supra* note 53, at 71 (“There are numerous examples of environmental problems in which effective action was preceded by extended delays, during which time harms accumulated that ultimately resulted in a much greater mess to clean up than if prompt action had been taken. . . . [T]he history of environmental policy is replete with many additional cases: asbestos, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PBDEs), and leaded gasoline to name just a few. In most cases, the time lapse between the initial evidence of harm and effective regulatory action was a decade or more, and in some instances, as in the case of asbestos, it was over a century.”); see also Susan Scutti, *Study: Public Water Supply Is Unsafe for Millions of Americans*, *CNN* (Aug. 9, 2016, 5:43 PM), <http://www.cnn.com/2016/08/09/health/contaminated-water/index.html> [https://perma.cc/RLR8-UPYS] (“Millions of Americans may be drinking water with unsafe levels of industrial chemicals These chemicals, known as polyfluoroalkyl and perfluoroalkyl substances or PFASs, have been linked to high cholesterol, obesity, hormone suppression—and even cancer. Introduced more than 60 years ago, PFASs are a category of man-made chemicals that degrade very slowly, if at all, in the environment.”).

coating applied to skillets and pans.⁵⁸ In addition to cookware, PFOA was ultimately used in hundreds of other products, including food containers, clothing, and carpet.⁵⁹

By 1961, through self-funded, secret medical studies, DuPont became aware that PFOA was dangerous,⁶⁰ yet the company remained silent.⁶¹ Meanwhile, employees regularly contracted “Teflon flu”—exemplified by “fever, nausea, diarrhea, vomiting—after working in one of the PFOA storage tanks.”⁶² Employees were instructed not to bring their work clothes home anymore.⁶³

3M also reported several concerns to DuPont. In 1978, 3M told DuPont that PFOA had been detected in the blood of workers at a plant that manufactured the chemical.⁶⁴ In 1981, 3M reported that PFOA caused birth defects in rats.⁶⁵ Thereafter, DuPont learned that two of its seven pregnant female employees gave birth to children with facial deformities.⁶⁶

Despite these health concerns and 3M’s recommendations for how to properly dispose of PFOA—through incineration or disposal at

58. Rich, *supra* note 56; see Michael Hawthorn, *INTERNAL WARNINGS: Industry Memos Show DuPont Knew for Decades That a Chemical Used to Make Teflon Is Polluting Workers and Neighbors*, COLUMBUS DISPATCH (Feb. 16, 2003); see also Opening Brief of Appellants at 6, *Rhodes v. E.I. du Pont de Nemours & Co.*, 636 F.3d 88 (4th Cir. 2011) (No. 10-1166) (stating that PFOA “persists in the environment and accumulates in living organisms over time”); Editorial, *Despite Clear Dangers, DuPont Kept Using a Toxic Chemical*, N.Y. TIMES (Jan. 12, 2016), <http://www.nytimes.com/2016/01/12/opinion/despite-clear-dangers-dupont-kept-using-a-toxic-chemical.html> [<https://perma.cc/J4YR-7DM8>].

59. See Sharon Kelly, *DuPont’s Deadly Deceit: The Decades-Long Cover-Up Behind the “World’s Most Slippery Material”*, SALON (Jan. 4, 2016, 4:00 AM), http://www.salon.com/2016/01/04/teflons_toxic_legacy_partner/ [<https://perma.cc/22AE-GS9U>]; Dennis Thompson, *Are There Toxins in Your Fast Food Packaging?*, CBS NEWS (Feb. 1, 2017, 12:43 PM), <https://www.cbsnews.com/news/toxins-in-fast-food-packaging-pfoa-pfos/> [<https://perma.cc/HD8H-ADLG>].

60. See Rich, *supra* note 56 (noting that PFOA, which was resistant to degradation, could increase the size of the liver in rats, rabbits, and dogs); see also Hawthorn, *supra* note 58; Tiffany Kary & Denise Trowbridge, *Dupont, Chemours Handed Another Loss in Teflon Chemical Case*, BLOOMBERG (July 6, 2016, 3:30 PM), <http://www.bloomberg.com/news/articles/2016-07-06/dupont-loses-third-case-over-teflon-toxin-chemours-to-pay> [<https://perma.cc/R5P2-P2SP>]; Kelly, *supra* note 59 (“Concerns about the potential toxicity of [PFOA] had been raised internally within DuPont by at least 1954, leading DuPont’s own researchers to conclude by at least 1961 that [PFOA] was toxic and, according to DuPont’s own Toxicology Section Chief, should be ‘handled with extreme care.’”).

61. See Kary & Trowbridge, *supra* note 60.

62. Rich, *supra* note 56.

63. See *id.*

64. See Sharon Lerner, *The Teflon Toxin: DuPont and the Chemistry of Deception*, INTERCEPT (Aug. 11, 2015, 5:35 PM), <https://theintercept.com/2015/08/11/dupont-chemistry-deception/> [<https://perma.cc/89PM-XBGW>].

65. Hawthorn, *supra* note 58; Rich, *supra* note 56.

66. Kelly, *supra* note 59; Rich, *supra* note 56.

chemical waste facilities—DuPont discharged “hundreds of thousands of pounds of PFOA powder” into the Ohio River and stored “7,100 tons of PFOA-laced sludge” in its facility’s digestion ponds, “open, unlined pits . . . from which the chemical could seep into the ground.”⁶⁷ As a result, PFOA entered the drinking water supply of over one hundred thousand people.⁶⁸ By 1984, DuPont knew that drinking water across the Ohio River was contaminated.⁶⁹

However, the health risks were outweighed by the monetary rewards. An internal document dated later in 1984 stated that while the “[l]egal and medical [departments] will likely take the position of total elimination,” the company executives concluded that cutting pollution was “not ‘economically attractive.’”⁷⁰ Therefore, rather than reducing its use of PFOA, DuPont increased production.⁷¹ It also continued to keep the dangers related to PFOA exposure secret.⁷²

Additional studies echoed earlier warnings, yet DuPont continued to put its profit before public welfare. In 1990, a study showed that 3M employees with long-term exposure to PFOA had higher rates of death from prostate cancer than employees who were not exposed.⁷³ Internal documentation indicated that “DuPont understood that PFOA caused cancerous testicular, pancreatic and liver tumors in lab animals.”⁷⁴ Rather than developing a less toxic or less risky alternative, DuPont decided to continue using PFOA.⁷⁵ As the *New York Times* noted, “[t]he risk was too great” given that PFOA products were “worth \$1 billion in annual profit.”⁷⁶

When its own safety limits were exceeded, the company remained silent and merely revised the safety limit so as to stay within the threshold. In 1991, DuPont set an internal safety limit of

67. Rich, *supra* note 56.

68. *Id.*; see also Kelly, *supra* note 59 (“By 2001, . . . [PFOA] had seeped into the water supply of at least six public water systems in West Virginia and Ohio.”).

69. Opening Brief of Appellants, *supra* note 58, at 7; see Hawthorn, *supra* note 58 (reporting that an August 29, 1984 “personal and confidential” memorandum from DuPont stated that PFOA was found in drinking water on both sides of the Ohio River); Kary & Trowbridge, *supra* note 60; Kelly, *supra* note 59 (“In 1984, DuPont began to secretly collect local tap water, asking employees to bring in jugs of water from their own homes, schools, and local businesses, and discovered that [PFOA] was making its way into public drinking water supplies in both Ohio and West Virginia at potentially dangerous levels.”).

70. Kelly, *supra* note 59.

71. *Id.*

72. *Id.*

73. Hawthorn, *supra* note 58.

74. Rich, *supra* note 56.

75. *Id.*

76. *Id.*

one part per billion for PFOA concentration in drinking water.⁷⁷ However, DuPont later found that one local water district contained PFOA levels at three times that amount.⁷⁸ At no time did DuPont notify regulators or the public.⁷⁹ Instead, DuPont merely adopted a new threshold of 150 parts per billion.⁸⁰

Eight years later, in 1999, Robert Bilott filed a federal suit against DuPont on behalf of Wilbur Tennant, a farmer whose cattle were dying after drinking water near DuPont's facility.⁸¹ During discovery Bilott uncovered fifty-year-old documents that indicated DuPont had long been aware of the dangers of PFOA.⁸² Thereafter, the parties settled for an undisclosed sum.⁸³

Although 3M ceased production of PFOA in 2000, DuPont continued to produce and use PFOA for another thirteen years.⁸⁴ During this time, a DuPont scientist stated in a 2001 email that "when airborne, [PFOA] is so hard to deal with that 'it might require the public to wear gas masks.'"⁸⁵

Despite actual knowledge of PFOA's toxicity and that its facilities had discharged PFOA into the surrounding drinking water, DuPont concealed this information from the public for fear that residents might seek to stop the company.⁸⁶ Troubled by DuPont's continuing concealment of this health hazard, Bilott sent a 972-page letter (along with 136 attached exhibits) to the Environmental Protection Agency (EPA) on March 6, 2001.⁸⁷ In it, he urged the EPA

77. *Id.* ("In Little Hocking, the water tested positive for PFOA at seven times the limit.").

78. *Id.*

79. *Id.*

80. *Id.*; *see also* Kelly, *supra* note 59 ("[A 2001 email by DuPont's in-house counsel] shows that company officials planned to push regulators to allow the public to be exposed to higher levels of the chemical than DuPont itself had recommended. . . . [Counsel] wrote: 'So far DuPont has been saying there are safe levels, we need to have an independent agency agree, we are hoping that it will agree to higher levels than we have been saying. If for no other reason than we are exceeding the levels we say we set as our own guideline, mostly because no one bothered to do air monitoring until now, and our water test has been completely inadequate.'").

81. Rich, *supra* note 56; *see also* Kelly, *supra* note 59 ("Within a few years, about 280 of Tennant's cattle, which drank water from the creek, had died. When the Tennants cut open a cow to investigate the cause of its death, they discovered that its internal organs had turned bright, neon green Tennant and his family members, too, suffered breathing difficulties and cancers.").

82. Rich, *supra* note 56.

83. Lerner, *supra* note 64.

84. Rich, *supra* note 56.

85. Kelly, *supra* note 59.

86. *See* Opening Brief of Appellants, *supra* note 58, at 12.

87. Rich, *supra* note 56.

to regulate PFOA immediately and provide clean water to affected persons.⁸⁸

This action opened a lengthy investigation by the EPA.⁸⁹ In 2004, the EPA filed a lawsuit against DuPont based on the company's two-decade concealment of PFOA's risks.⁹⁰ In 2005, the EPA reached a \$16.5 million settlement with DuPont for its failure to report such health risks.⁹¹ This settlement accounted for the highest civil penalty ever assessed by the EPA,⁹² yet the fine amounted to less than 2 percent of DuPont's profits from PFOA in that year alone.⁹³ Furthermore, DuPont was not required to immediately pull PFOA from the market.⁹⁴ Despite the Ohio EPA's classification of PFOA as a toxic air pollutant,⁹⁵ DuPont and the federal EPA negotiated a voluntary phase-out by 2015.⁹⁶

The effects of DuPont's decades-long use of PFOA had tragic consequences. Between 1999 and 2012, PFOA was found in the blood samples of *99 percent* of the US population.⁹⁷ The chemical was "detected in water, wildlife, and humans worldwide."⁹⁸ Animal studies resulted in developmental defects, liver toxicity, kidney toxicity, immune defects, and cancer.⁹⁹ Meanwhile, "[h]uman epidemiology data report associations between PFOA exposure and high cholesterol, increased liver enzymes, decreased vaccination response, thyroid disorders, pregnancy-induced hypertension and preeclampsia, and cancer (testicular and kidney)."¹⁰⁰ According to the EPA, "a single exposure to a developmental toxin at a critical time in development can produce an adverse effect."¹⁰¹ Further, the effects of short-term exposure can last for years and are exacerbated by additional

88. *Id.*

89. *Id.*

90. Kelly, *supra* note 59.

91. Juliet Eilperin, *DuPont, EPA Settle Chemical Complaint*, WASH. POST (Dec. 15, 2005), <http://www.washingtonpost.com/wp-dyn/content/article/2005/12/14/AR2005121402275.html> [<https://perma.cc/R6VU-9WGX>].

92. *Id.*

93. Rich, *supra* note 56.

94. Kelly, *supra* note 59.

95. Opening Brief of Appellants, *supra* note 58, at 11.

96. Kelly, *supra* note 59.

97. EPA, DOC. NO. 822-R-16-005, DRINKING WATER HEALTH ADVISORY FOR PERFLUOROOCTANOIC ACID (PFOA) 9 (2016), https://www.epa.gov/sites/production/files/2016-05/documents/pfoa_health_advisory_final_508.pdf [<https://perma.cc/W56F-9F7M>].

98. *Id.* at 11.

99. *Id.* at 9, 35–39, 44–45; *see also* Rich, *supra* note 56.

100. EPA, *supra* note 97, at 9, 39–42, 45–46; *see also* Rich, *supra* note 56.

101. EPA, *supra* note 97, at 10.

exposures.¹⁰² As a result of these findings, the EPA issued a safety limit for PFOA of 0.07 micrograms per liter or 70 parts per trillion.¹⁰³

In December 2011, independent scientists began releasing their findings.¹⁰⁴ They confirmed what DuPont had known for decades¹⁰⁵—that “there was a ‘probable link’ between PFOA and kidney cancer, testicular cancer, thyroid disease, high cholesterol, pre-eclampsia and ulcerative colitis.”¹⁰⁶

Once these secrets were revealed, civil lawsuits were filed by those affected. In October 2015, DuPont was found liable in the first of 3,535 personal-injury lawsuits.¹⁰⁷ The jury awarded that plaintiff \$1.6 million in damages.¹⁰⁸ In July 2016, a second lawsuit against DuPont resulted in an award of \$5.1 million in compensatory damages, along with \$500,000 in punitive damages due to DuPont’s malice.¹⁰⁹

B. Vinyl Chloride

Another toxic chemical—vinyl chloride—was processed into PVC plastic.¹¹⁰ PVC is used in a range of household and industrial products, “from raincoats and shower curtains to window frames and indoor plumbing.”¹¹¹

102. *Id.*

103. *Id.* at 9. One microgram per liter is equal to one part per billion. TERRIE K. BOGUSKI, CTR. FOR HAZARDOUS SUBSTANCE RESEARCH, BROWNFIELDS RESOURCES: UNDERSTANDING UNITS OF MEASURE 1 (2006), https://cfpub.epa.gov/ncer_abstracts/index.cfm/fuseaction/display/files/fileID/14285 [<https://perma.cc/22CF-AX2Q>]. “A way to visualize one part per billion (ppb) in water is to think of it as one drop in one billion drops of water . . .” *Id.*

104. Rich, *supra* note 56.

105. Opening Brief of Appellants, *supra* note 58, at 10–12 (“The toxic and hazardous nature of PFOA was confirmed by DuPont’s experts in August 2004: ‘the epidemiological and scientific literature . . . indicates . . . that there is a risk of adverse human health effects from exposure to [PFOA] including ‘liver disease or liver effects’ and ‘cancers,’ including ‘kidney cancer in particular, in those exposed to [PFOA].’ That expert noted ‘cholesterol abnormalities’ that suggested potential cardiovascular implications.” (citations omitted)).

106. Rich, *supra* note 56; *see also* Opening Brief of Appellants, *supra* note 58, at 9–10.

107. Rich, *supra* note 56; *see also* Kelly, *supra* note 59.

108. Kary & Trowbridge, *supra* note 60; Kelly, *supra* note 59.

109. Jessica Dye, *DuPont Must Pay Extra \$500,000 in Lawsuit over Teflon-Making Chemical*, REUTERS (July 8, 2016, 12:13 PM), <http://www.reuters.com/article/us-dupont-verdict-idUSKCN0ZO21V> [<https://perma.cc/8J3R-AMF8>].

110. EPA, VINYL CHLORIDE 1 (2000), <https://www.epa.gov/sites/production/files/2016-09/documents/vinyl-chloride.pdf> [<https://perma.cc/L3FL-Q7MG>]; *Trade Secrets: A Moyers Report*, *supra* note 54, at 10:56–11:10.

111. *Polyvinyl Chloride: Chemical Compound*, ENCYCLOPÆDIA BRITANNICA, <https://www.britannica.com/science/polyvinyl-chloride> [<https://perma.cc/H7EM-FQV3>] (last visited Apr. 1, 2018).

Documents uncovered during a lawsuit in the 1990s indicate that the industry knew for decades that vinyl chloride was dangerous.¹¹² For example, a May 1959 document to the Director of the Department of Industrial Hygiene at the BF Goodrich Company stated that “[w]e have been investigating vinyl chloride a bit. . . . We feel quite confident that 500 parts per million is going to produce rather appreciable injury when inhaled 7 hours a day, five days a week for an extended period.”¹¹³ Meanwhile, workers were being regularly exposed to at least 500 parts per million.¹¹⁴ Seven years later, an October 6, 1966, BF Goodrich memo stated that “[t]he clinical manifestations are such as to suggest the possibility of a disabling disease as a later development. . . . [The company is] worried about possible long term effect on body tissue especially if it proves to be systemic.”¹¹⁵ Yet the company continued to keep these dangers secret from its workforce.¹¹⁶

BF Goodrich was not alone in keeping this information secret. Intercompany correspondence at Union Carbide, dated November 24, 1959, stated that “[v]inyl chloride monomer is more toxic than has been believed.”¹¹⁷ Moreover, companies communicated with one another about these risks. A communication from BF Goodrich to Union Carbide, Imperial Chemical, and Monsanto stated that “[t]here is no question that skin lesions, absorption of bone of the terminal joints of the hands, and circulatory changes can occur in workers associated with the polymerization of PVC. . . . Of course, the confidentiality of this data is exceedingly important.”¹¹⁸ Thus, the companies marked these documents “secret” and “confidential.”¹¹⁹ And in the early 1970s—amid additional reports stating that “the results on rats are probably undeniable”¹²⁰ and that “[a]ll agreed the results certainly indicate a positive carcinogenic effect above or at 250 parts per million”¹²¹—European and US chemical companies signed an

112. *Trade Secrets: A Moyers Report*, *supra* note 54, at 6:58–11:39; *see also Trade Secrets: The Documents*, PBS, <http://www.pbs.org/tradesecrets/program/vinyl.html> [https://perma.cc/9D3L-3E3C] (last visited Apr. 1, 2018) (providing supporting documents to the documentary).

113. *Trade Secrets: A Moyers Report*, *supra* note 54, at 12:15–12:35.

114. *Id.* at 12:46–12:51.

115. *Id.* at 18:00–18:50.

116. *Id.* at 17:29–18:00.

117. *Id.* at 12:52–13:12.

118. *Id.* at 15:25–16:00.

119. *See, e.g., id.* at 28:00–28:30.

120. *Id.* (highlighting Union Carbide’s confidential internal correspondence, dated Feb. 13, 1973).

121. *Compare id.* (highlighting Ethyl Corporation’s internal communications regarding vinyl chloride), *with* EPA, *supra* note 110, at 2 (“[The] EPA has established a Reference

agreement not to disclose the identity of their researchers to industry outsiders.¹²²

Even after the federal government, through its newly created National Institute for Occupational Safety and Health (NIOSH), requested all health and safety information regarding vinyl chloride in 1973,¹²³ and a staff member of the industry's trade association sent a letter to member companies urging that they tell NIOSH their findings, the industry did not provide such information to NIOSH.¹²⁴ Meanwhile, those working in vinyl chloride plants "were being told there was nothing to worry about, that there [was] no danger," and that the industry would "protect the work force."¹²⁵ Instead, the companies paid the scientists to come to the conclusions the companies wanted,¹²⁶ thus corrupting the research.¹²⁷ Rather than studying the workers who were most directly exposed, the scientists evaluated the workers on the margin of the process.¹²⁸ Therefore, "[i]n the end, the industry got a report that said what it wanted,"¹²⁹ proving that "[s]cience is easy to manipulate."¹³⁰

Concentration (RfC) of 0.1 milligrams per cubic meter, and a Reference Dose (RfD) of 0.003 milligrams per kilogram per day for vinyl chloride.").

122. *Trade Secrets: A Moyers Report*, *supra* note 54, at 27:07–27:23.

123. *Id.* at 28:43–29:05.

124. *See id.* at 29:08–30:03 (reporting that an industry trade association letter to member companies, dated March 26, 1973, stated: "There is the aspect of moral obligation not to withhold from the Government significant information having occupational and environmental relevance. . .").

125. *Id.* at 32:30–32:48.

126. *Id.* at 36:00–36:26.

127. *Id.* at 36:26–36:46.

128. *Id.* at 36:45–37:40.

129. *Id.* at 40:10–40:14.

130. *Id.* at 40:06–40:08.

The EPA now states that

[a]cute (short-term) exposure to high levels of vinyl chloride in air has resulted in central nervous system effects (CNS), such as dizziness, drowsiness, and headaches in humans. Chronic (long-term) exposure to vinyl chloride through inhalation and oral exposure in humans has resulted in liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation, as vinyl chloride exposure has been shown to increase the risk of a rare form of liver cancer in humans. EPA has classified vinyl chloride as a Group A, human carcinogen.¹³¹

While workers' compensation was available to shield corporations from suits by employees, no such mechanism was available to shield corporations from suits by consumers.¹³² This possibility of unlimited liability gave the industry pause with regard to use of vinyl chloride in aerosols.¹³³ As a result, companies began phasing out their use of such products. However, they did so quietly; "[n]o public warning was issued."¹³⁴ Thus, it is impossible to determine the number of hairdressers and their customers who were sickened or died as a result of exposure to vinyl chloride.¹³⁵

In 1974, after a number of employees died from angiosarcoma (a cancer of the liver), and over industry objections, the government reduced permissible workplace exposure to vinyl chloride to one part per million.¹³⁶ Because the companies were able to keep the dangers of vinyl chloride secret for fifteen years, they were able to keep making money on these products despite the clear dangers posed to public health.

C. Benzene

The American Cancer Society describes benzene as "a colorless, flammable liquid with a sweet odor," which "evaporates quickly when

131. EPA, *supra* note 110, at 1.

132. See *Trade Secrets: A Moyers Report*, *supra* note 54, at 43:45–44:10 (referring to a Union Carbide internal correspondence as stating, "[i]f vinyl chloride proves to be hazardous to health, a producing company's liability to its employees is limited by various Workmen's Compensation laws").

133. See *id.* at 44:51–45:20 (quoting an Ethyl Corporation interoffice memorandum that states Dow "is questioning the aspect of making sales of vinyl chloride monomer when the known end use is as an aerosol propellant since [the] market is small but potential liability is great"); *id.* at 45:22–45:37 (quoting an Allied Chemical Corporation memorandum's admonition that "serious consideration should be given to withdrawal from" the market for vinyl chloride monomer as aerosol propellant); *id.* at 43:14–43:45 (quoting a BF Goodrich Chemical Company memorandum dated March 24, 1969: "Calculations have been made to show the concentration of propellant in a typical small hair dresser's room. . . . All of this suggests that beauty operators may be exposed to concentrations of vinyl chloride monomer equal to or greater than the level in our polys.")).

134. *Id.* at 46:32–46:41.

135. *Id.* at 46:43–46:58.

136. *Id.* at 47:06–47:26, 49:49–49:58.

exposed to air.”¹³⁷ It is primarily used as a reagent for synthesizing other chemicals, “including plastics, lubricants, rubbers, dyes, detergents, drugs, and pesticides.”¹³⁸ Historically, it was also used as an industrial solvent—to “dissolve or extract other substances”—and as a gasoline additive.¹³⁹

“[A]s with vinyl chloride, the industry’s own medical officers had known of benzene’s toxicity for a very long time.”¹⁴⁰ In 1948, the American Petroleum Institute’s toxicology profile of benzene “discussed ‘reasonably well documented instances of the development of leukemia as a result of chronic benzene exposure,’ cautioning that ‘the only absolutely safe concentration . . . is zero.’”¹⁴¹ This was echoed in 1958 by Esso Oil’s medical research division, which stated that “[m]ost authorities agree the only level which can be considered absolutely safe for prolonged exposure is zero.”¹⁴² The industry response was to shield internal records, disclosing them only on court order.¹⁴³

Subsequent lawsuits uncovered a trove of secret documents detailing the industry’s campaign to undercut outside scientific investigations.¹⁴⁴ Indeed, the industry spent over \$36 million on counterresearch to protect its own economic interests.¹⁴⁵ As a former employee and whistleblower explained, “[i]t’s all about influencing science to get what industry wants.”¹⁴⁶ In this regard, benzene is “a

137. *Benzene and Cancer Risk*, AM. CANCER SOC’Y, <http://www.cancer.org/cancer/cancercauses/othercarcinogens/intheworkplace/benzene> [<https://perma.cc/A9JT-QFR2>] (last updated Jan. 5, 2016).

138. *Id.*; accord Lombardi, *supra* note 56.

139. *Benzene and Cancer Risk*, *supra* note 137.

140. See *Trade Secrets: A Moyers Report*, *supra* note 54, at 52:52–53:02; see also STEEL, *supra* note 53, at 71 (“Reports of benzene causing aplastic anemia date to 1897, while the first studies linking benzene to leukemia date to 1928. In the US, effective regulations on benzene were not introduced until 1977, and implementation of these regulations were delayed a decade further due to litigation.”).

141. Lombardi, *supra* note 56.

142. *Trade Secrets: A Moyers Report*, *supra* note 54, at 53:03–53:27 (quoting a 1958 Esso Oil memorandum).

143. Lombardi, *supra* note 56.

144. The American Petroleum Institute challenged the National Cancer Institute (NCI) study “from every conceivable angle,” creating sufficient doubt regarding that study to persuade the EPA not to rely on the NCI’s research in 2000. *Id.*

145. *Id.* In advance of the industry’s studies, anticipated results were laid out: “[p]rovide strong scientific support for a lack of a risk of leukemia[;] . . . [e]stablish . . . current occupational exposure limits do not create a significant risk[; and] [r]efute the allegation that Non-Hodgkin’s lymphoma can be induced by benzene exposure.” *Id.*

146. *Id.* (reporting a statement made by Mobil’s former chief toxicologist, Myron Mehlman, “who became a whistleblower in 1989 after the company fired him for complaining about benzene levels in its gasoline. He sued Mobil, winning a \$7 million judgment.”); see also

good example of how the general scientific literature is being polluted by people working for industry.”¹⁴⁷

Even “as evidence mounted connecting benzene to leukemia,” the industry continued to challenge and delay regulations from going into effect.¹⁴⁸ Rather than changing its behavior, the petrochemical industry turned to the courts to impede regulatory reform,¹⁴⁹ arguing that reduction of benzene exposure would be “too costly.”¹⁵⁰

Benzene is now a known human carcinogen.¹⁵¹ As of May 2014, the EPA “estimated that 5 million Americans—not counting those with workplace exposures—face heightened cancer risks from benzene and 68 other carcinogens spewed into the air by . . . the nation’s 149 oil refineries.”¹⁵² Countless lawsuits have been (and are still being) filed.

Money clearly motivated this ongoing secrecy, despite the repeated findings that such chemicals posed a danger to public health.¹⁵³ These companies wanted to continue making profits on the products as they existed. They did not want to invest in research and development to change the process or product in a manner that would reduce or remove such dangers, and they did not want to be held

Morris, *supra* note 53 (detailing Georgia Pacific’s research program and publication of articles to cast doubt on others’ scientific research regarding the dangers of asbestos exposure).

147. Lombardi, *supra* note 56 (reporting a statement made by Peter Infante, “a former director of the office that reviews health standards at the Occupational Safety and Health Administration, who has studied the pollutant for 40 years”).

148. See *Trade Secrets: A Moyers Report*, *supra* note 54, at 51:36–51:54 (“[T]he Occupational Safety and Health Administration—OSHA—ordered that workplace exposure be lowered to one part per million—a regulation the industry, then producing 11 billion pounds a year, would challenge.”).

149. See Lombardi, *supra* note 56 (“[Industry-financed scientific reports] play[ed] a critical role in the benzene litigation, . . . help[ing] companies deny liability by casting doubt on causation, the central issue in a toxic-tort lawsuit.”).

150. *Trade Secrets: A Moyers Report*, *supra* note 54, at 54:20–54:35 (“The Fifth Circuit Court of Appeals in New Orleans—in America’s petrochemical heartland—ruled that the government had not proved the danger to humans to be great enough to justify the cost to industry.”).

151. EPA, TOXICITY AND EXPOSURE ASSESSMENTS FOR CHILDREN’S HEALTH 1 (2009), https://archive.epa.gov/region5/teach/web/pdf/benz_summary.pdf [<https://perma.cc/C5RF-VB5R>]; *Benzene and Cancer Risk*, *supra* note 137; Lombardi, *supra* note 56.

152. Lombardi, *supra* note 56.

153. See CUMMINGS, *supra* note 42, at 12 (“[T]hese companies were concerned not with public health but with avoiding responsibility for the harm they caused.”); Richards, *supra* note 53 (“Now we know what they knew and did, and that was to try to put a lid on the whole thing and keep on making money.”); *Trade Secrets: A Moyers Report*, *supra* note 54, at 1:04:27–1:04:44 (showing a portion of an interview with Jacqueline Warren, a former attorney for the Natural Resources Defense Council, who stated that companies are “interested in their bottom line, their stockholders, their product, and they’re not as interested at all in what the potential health or safety or environmental effect of exposure to this might be”).

publicly or monetarily accountable for the resultant injuries to their employees, customers, or the neighboring public and environment. In light of such historical trade secret abuse and the continuing monetary motivation, suspicion that companies continue to engage in such immoral practices remains. Such suspicion is not misplaced. As veteran journalist Bill Moyers observed in his *Trade Secrets* report, “[w]e think we are protected but, in fact, chemicals are presumed safe—innocent—until proven guilty.”¹⁵⁴

V. CURRENT EXAMPLES OF TRADE SECRECY ABUSE

As discussed above, the chemical revolution of the past sixty years has produced thousands of man-made chemicals that have not been tested for their effect on the public’s health and safety. Each week, we are bombarded with new products and processes. Indeed, “an average of twenty new chemicals enter the marketplace *every week*,”¹⁵⁵ and 80 percent of processed foods and a large percentage of fresh foods are now genetically modified.¹⁵⁶ Unfortunately, consumers do not know much about what impact these materials will have on human beings or the environment.¹⁵⁷ Consumers are, essentially, acting as test subjects.

Hydraulic fracturing and genetically modified foods, discussed in depth below, are two current examples of trade secrets that pose potential dangers to human health. Other areas of current concern include synthetic fragrances,¹⁵⁸ cosmetics,¹⁵⁹ e-cigarettes,¹⁶⁰ and flame

154. *Trade Secrets: A Moyers Report*, *supra* note 54, at 0:33–0:40; *see also* Alissa Cordner, *Why Chemicals in the U.S. Are Still “Innocent Until Proven Guilty”*, SMITHSONIAN (July 18, 2016), <http://www.smithsonianmag.com/science-nature/why-chemicals-us-are-still-innocent-until-proven-guilty-180959818/> [<https://perma.cc/Q2TY-YPLE>].

155. *Trade Secrets: A Moyers Report*, *supra* note 54, at 1:14:35–1:14:40 (emphasis added).

156. CUMMINGS, *supra* note 42, at 20; *see* Margie Kelly, *Top 7 Genetically Modified Crops*, HUFFINGTON POST (Oct. 30, 2012, 5:05 PM), https://www.huffingtonpost.com/margie-kelly/genetically-modified-food_b_2039455.html [<https://perma.cc/LT74-7C93>].

157. *See* Kelly, *supra* note 59 (“With no mandatory safety testing for the vast majority of the tens of thousands of chemicals used daily in America, doctors and public health officials have little information to guide them as they seek to identify potential health hazards . . .”).

158. *See* Brian Brinks, *Why Do We Call a Spritz of Chemicals an “Air Freshener”?*, LIFE OF BRIAN: ENVTL. & SUSTAINABLE LIVING BLOG (Oct. 19, 2010), <http://www.lifeofbrian.ca/index.php/2010/10/why-call-a-spritz-of-chemicals-an-air-freshener/> [<https://perma.cc/7E7U-H3ZJ>] (“Most Shampoos, soaps, perfume/colognes, cosmetics, detergents, fabric softeners, cleaners, candles . . . etc[.], contain synthetic ‘fragrance.’ [Yet,] the true chemical makeup of ‘fragrance’ is tightly protected as a ‘trade secret.’”).

159. *See* “Trade Secret” *Ingredients*, FDA, <http://www.fda.gov/Cosmetics/Labeling/ucm414211.htm> [<https://perma.cc/UQ8J-YYLH>] (last updated Nov. 4, 2017) (“FDA requires cosmetics to have an ‘ingredient declaration,’ a list of all the product’s ingredients. . . . [However,] fragrance and flavor ingredients do not need to be listed individually on cosmetic labels, because

retardants.¹⁶¹ Although concerning, those products are not discussed in detail within this Article.

Business records that hide nefarious activity—such as mortgage lending practices,¹⁶² emissions records,¹⁶³ donation expenditures,¹⁶⁴ and safety protocols¹⁶⁵—are also capable of being

they are the ingredients most likely to be ‘trade secrets.’ Instead, they may be listed simply as ‘fragrance’ or ‘flavor.’”).

160. See Don Hopey, *New Rules Ban Sale of E-Cigs to Minors*, PITTSBURGH POST-GAZETTE (May 5, 2016, 9:01 AM), <http://www.post-gazette.com/news/health/2016/05/05/FDA-brings-e-cigarettes-under-federal-authority-electronic-cigarettes-regulations/stories/201605050181> [<https://perma.cc/VA4E-RYZ5>] (“[B]ecause e-cigarettes are so new . . . it’s too soon to know their long-term health impacts; studies, however, show the aerosol vapor can contain known carcinogens, respiratory irritants and volatile organic compounds, including benzene, toluene and styrene.”).

161. See Michael Hawthorn, *Firemaster 550 the Latest Flame Retardant Allowed onto Market Without Thorough Study*, CHI. TRIB. (May 10, 2012), <http://www.chicagotribune.com/news/ct-met-flames-regulators-20120510-story.html> [<https://perma.cc/5UED-QH6V>] (“When Firemaster 550 replaced penta, its chemical makeup was a mystery to all but the manufacturer and a select group of EPA employees who were sworn to secrecy. That made it difficult for outside scientists to identify its ingredients in the environment and determine if they are harmful. . . . Chemtura already is marketing an alternative flame retardant called Emerald NH-1. . . . The company says the polymer-based substance doesn’t contain bromine or chlorine, . . . [b]ut the ingredients remain a trade secret.”); see also 21 C.F.R. §§ 20.20(a), 20.21(a), 20.61(c), 20.82(b), 20.111(c)(2), 20.111(d), 20.113(a) (2018).

162. See Jennifer Liberto, *Fed to Release Wall Street Crisis Loan Data*, CNN: MONEY (Mar. 21, 2011, 12:53 PM), http://money.cnn.com/2011/03/21/news/economy/fed_contracts_open_records/ [<https://perma.cc/A5VK-69W7>] (“Bloomberg LP, owner of Bloomberg News, had filed the lawsuit seeking details on a program that gave banks access to cheap loans in 2008. The Fed had originally refused to release the data, citing exemptions in open records laws for trade secrets.”).

163. See *Volkswagen Case: Could Cheating on an Emissions Test Become a Protected Trade Secret?*, JULIA REDA (Sept. 10, 2015), <https://juliareda.eu/2015/10/volkswagen-trade-secrets/> [<https://perma.cc/87R2-VGYD>] (“The European Parliament is currently negotiating the Trade Secret Directive in trilogue. In this week’s plenary session I called on my colleagues: *We must be very careful not to include in that Directive new lines of defense for companies’ dirty secrets.*”).

164. See Arit John, *Red Cross Refuses to Disclose Full Details of Hurricane Sandy Spending*, ATLANTIC (June 27, 2014), <http://www.thewire.com/national/2014/06/red-cross-refuses-to-disclose-details-of-hurricane-sandy-spending/373583/> [<https://perma.cc/3X4N-K8A8>]; Rob Shwartz & Vann Pearce, *DONATE, DON’T TELL? The Red Cross Says It Has Trade Secrets, Upsetting Activists*, ORRICK: TRADE SECRETS WATCH (July 17, 2014), <http://blogs.orrick.com/trade-secrets-watch/2014/07/17/donate-dont-tell-the-red-cross-says-it-has-trade-secrets-upsetting-activists/> [<https://perma.cc/DL48-P4JR>] (reporting that the Red Cross argued that “information on how the Red Cross spent Hurricane Sandy relief donations” qualified as “trade secrets exempt from New York’s Freedom of Information Law”); Debra Cassens Weiss, *Red Cross Claims Some Hurricane Sandy Spending Information Is a Trade Secret*, A.B.A. J. (June 30, 2014, 10:45 AM), http://www.abajournal.com/news/article/red_cross_claims_some_hurricane_sandy_spending_information [<https://perma.cc/2F8W-FLQA>] (“[The Red Cross’s counsel] argued that information about fundraising, internal operations and finances should be exempt from disclosure. If the information were released, . . . ‘the American Red Cross would suffer competitive harm because its competitors would be able to mimic the American Red Cross’s business model for an increased competitive advantage.’”).

protected as trade secrets, which may result in monetary harm to others. This Article, however, focuses on those trade secrets that cause direct or indirect physical harm to people.

A. Hydraulic Fracturing

Hydraulic fracturing, or “fracking,” involves the injection of millions of gallons of fluid into shale beds at high pressure in order to force open existing fissures and extract oil or gas.¹⁶⁶ In 2015, there were three hundred thousand fracking wells in the United States, up from twenty-three thousand in the year 2000.¹⁶⁷

While 99 percent of fracking fluid is composed of water and sand, gas drillers add hundreds of chemicals to the mixture.¹⁶⁸ Many of these chemicals are classified as known or possible human carcinogens.¹⁶⁹

Studies indicate that fracking results in adverse health effects to humans and livestock.¹⁷⁰ People exposed have experienced

165. See Jessica Mendelson, *A Whale of a Trade Secret . . . or Not?*, SEYFARTH SHAW: TRADING SECRETS (Dec. 4, 2013), <http://www.tradesecretslaw.com/2013/12/articles/trade-secrets/a-whale-of-a-trade-secret-or-not/> [https://perma.cc/7C6N-JRCF]; Mark Patrick, *Seaworld's Killer Whale Safety Protocols Withheld as Trade Secret*, AM. U.: INTELL. PROP. BRIEF (Oct. 27, 2013), <http://www.ipbrief.net/2013/10/27/seaworlds-killer-whale-safety-protocols-withheld-as-trade-secret/> [https://perma.cc/6C7L-RCFX].

166. See ALEX PRUD'HOMME, HYDROFRACKING: WHAT EVERYONE NEEDS TO KNOW 2 (2014).

167. Matt Egan, *Fracking Fallout: 7.9 Million at Risk of Man-Made Earthquakes*, CNN: MONEY (Mar. 29, 2016, 3:50 PM), <http://money.cnn.com/2016/03/29/investing/earthquakes-fracking-usgs-oil-gas/> [https://perma.cc/GQA4-2WYX].

168. See JOHN LOCKE FOUND., SPOTLIGHT NO. 460, THE CHEMICALS IN FRACKING FLUIDS: EARTH AND WATER, YOU'LL FIND PLENTY OF BOTH DOWN THERE 2 (2014), <https://www.johnlocke.org/app/uploads/2016/06/Spotlight460ChemicalsinFrackingFluids.pdf> [https://perma.cc/XR93-HXFR]; see also JAMES T. O'REILLY, THE LAW OF FRACKING § 10:11, at 110–11 (2015) (“[C]ompanies reported using more than 2,500 products containing 750 chemicals and other components [between 2005 and 2009]—in a quarter of the products were chemicals classified as ‘known or possible human carcinogens,’ which could have been regulated under the Safe Drinking Water Act, or listed as hazardous air pollutants.”).

169. See O'REILLY, *supra* note 168, § 10:11, at 110–11; PRUD'HOMME, *supra* note 166, at 83 (citing OFFICE OF FOSSIL ENERGY & NAT'L ENERGY TECH. LAB., U.S. DEPT OF ENERGY, MODERN SHALE GAS DEVELOPMENT IN THE UNITED STATES (2009), https://www.energy.gov/sites/prod/files/2013/03/f0/ShaleGasPrimer_Online_4-2009.pdf [https://perma.cc/KVY9-865W]) (“While some of the chemicals are common and benign—sodium chloride (used in table salt), borate salts (used in cosmetics), or guar gum (used to make ice cream)—others contain toxic additives—such as benzene (a carcinogen) or the solvent 2-Butoxyethanol, known as 2-BE. While they comprise a tiny percentage of the mixture, hazardous exposure to some of these chemicals is measured in the parts per million.”).

170. See PRUD'HOMME, *supra* note 166, at 85 (stating that forty of the chemicals used in fracking “had ‘the potential to cause multiple adverse health effects,’ and 19 . . . cause

“burning of the eyes/nose/throat, headaches, rashes, nosebleeds, and gastrointestinal distress,” as well as upper-respiratory problems, “confusion,” “extreme fatigue . . . and sensory deficits.”¹⁷¹ Livestock and pets exposed to fracking chemicals have died or been sickened and have encountered reproductive defects.¹⁷² Moreover, exposed livestock “are not tested for chemical contaminants before slaughter,” where they then enter the food supply.¹⁷³

In addition to the increase in earthquakes that appear related to fracking,¹⁷⁴ the process has had many deleterious effects on the environment. For example, “wastewater is frequently sent to treatment plants that were not designed to treat it.”¹⁷⁵ Two hundred eighty billion gallons of wastewater were created in 2012 alone.¹⁷⁶ Groundwater contamination has also occurred.¹⁷⁷ Moreover, fracking

‘deleterious effects on the environment’” (quoting OFFICE OF FOSSIL ENERGY & NAT’L ENERGY TECH. LAB., *supra* note 169)).

171. O’REILLY, *supra* note 168, § 10:12, at 114 (citing Michelle Bamberger & Robert E. Oswald, *Impacts of Gas Drilling on Human and Animal Health*, 22 NEW SOLUTIONS 51, 51–77 (2012)); *see also id.* § 10:1, at 102 (“Some of these chemicals are very hazardous in deep rock layers, as well as on the surface while being pumped, and their unintended effects on humans on the surface can be a persistent problem for those living nearby.”).

172. *Id.* § 10:12, at 113 (citing Bamberger & Oswald, *supra* note 171, at 51–77).

173. *Id.* § 10:12, at 114.

174. *See* Egan, *supra* note 167 (reporting that seismic activity is on the rise in certain energy-intensive states after a relatively stable thirty-year period); *see also* Jessica Fitzpatrick & Mark Petersen, *Induced Earthquakes Raise Chances of Damaging Shaking in 2016*, USGS (Mar. 28, 2016, 12:46 PM), https://www2.usgs.gov/blogs/features/usgs_top_story/induced-earthquakes-raise-chances-of-damaging-shaking-in-2016/ [<https://perma.cc/U4JD-7Q5P>].

175. O’REILLY, *supra* note 168, § 10:13, at 116–17; *see also* Ian Urbina, *EPA Steps Up Scrutiny of Pollution in Pennsylvania Rivers*, N.Y. TIMES (Mar. 7, 2011, 12:59 PM), <http://www.nytimes.com/2011/03/08/science/earth/08water.html> [<https://perma.cc/9Y9G-S722>]; Ian Urbina, *Pressure Limits Efforts to Police Drilling for Gas*, N.Y. TIMES (Mar. 3, 2011), <http://www.nytimes.com/2011/03/04/us/04gas.html> [<https://perma.cc/TB4N-ERAK>]; Ian Urbina, *Regulation Lax as Gas Wells’ Tainted Water Hits Rivers*, N.Y. TIMES (Feb. 26, 2011), http://www.nytimes.com/2011/02/27/us/27gas.html?pagewanted=all&_r=0 [<https://perma.cc/PB6X-YJ2F>].

176. *See* O’REILLY, *supra* note 168, § 10:12, at 112 (citing *Natural Gas: U.S. Natural Gas Monthly Supply and Disposition Balance*, U.S. ENERGY INFO. ADMIN., https://www.eia.gov/dnav/ng/ng_sum_sndm_s1_m.htm [<https://perma.cc/2Z6C-U4PH>] (last updated Mar. 30, 2018)).

177. *See id.*; PRUD’HOMME, *supra* note 166, at 76 (citing Amy Mall, *Incidents Where Hydraulic Fracturing Is a Suspected Cause of Drinking Water Contamination*, NRDC: EXPERT BLOG (Feb. 28, 2014), <https://www.nrdc.org/experts/amy-mall/incidents-where-hydraulic-fracturing-suspected-cause-drinking-water-contamination> [<https://perma.cc/F36K-Q2JR>]) (“In the United States, hydrofracking is suspected in at least 36 cases of groundwater contamination, and in several cases EPA has determined that it was the likely source of pollution.”).

has been linked “to unhealthy levels of smog and toxic air contaminants.”¹⁷⁸

Despite these harms, gas drillers have refused to disclose what chemicals are used, claiming disclosure would instruct others on how to use a similar combination in a similar shale bed.¹⁷⁹ While that know-how is likely to have value,¹⁸⁰ the resulting damage to public health is unacceptable.¹⁸¹

Unfortunately, hydraulic fracturing is exempt from all of the environmental laws that would normally protect the public and the environment—namely, the Clean Air Act; the Clean Water Act; the Safe Drinking Water Act; the Resource Conservation and Recovery

178. NAT'L RES. DEF. COUNCIL, FRACKING FUMES: AIR POLLUTION FROM HYDRAULIC FRACTURING THREATENS PUBLIC HEALTH AND COMMUNITIES 2 (2014), <https://www.nrdc.org/sites/default/files/fracking-air-pollution-IB.pdf> [https://perma.cc/2S7D-6X4A]; see also EPA, OVERVIEW OF FINAL AMENDMENTS TO AIR REGULATIONS FOR THE OIL AND NATURAL GAS INDUSTRY: FACT SHEET 3 (2012), https://www.epa.gov/sites/production/files/2016-09/documents/natural_gas_transmission_fact_sheet_2012.pdf [https://perma.cc/KL2Y-G9X4] (“The oil and gas industry is a significant source of VOCs, which contribute to the formation of ground-level ozone (smog). . . . [S]ome of the largest air emissions in the natural gas industry occur as natural gas wells that have been fractured are being prepared for production. During a stage of well completion known as ‘flowback,’ fracturing fluids, water, and reservoir gas come to the surface at a high velocity and volume. This mixture includes a high volume of VOCs and methane, along with air toxics such as benzene, ethylbenzene and n-hexane. The typical flowback process lasts from three to 10 days. Pollution also is emitted from other processes and equipment in the industry that prepare gas for sale and that assist in moving it through pipelines.”); PHYSICIANS FOR SOC. RESPONSIBILITY, HYDRAULIC FRACTURING AND YOUR HEALTH: AIR CONTAMINATION, <http://www.psr.org/assets/pdfs/fracking-and-air-pollution.pdf> [https://perma.cc/3T8H-3G3B] (last visited Apr. 2, 2018).

179. O'REILLY, *supra* note 168, § 10:1, at 102 (citing Mike Soraghan, *Hydraulic Fracturing: Two Thirds of Frack Disclosures Omit ‘Secrets’*, E&E NEWS (Sept. 26, 2012), <https://www.eenews.net/stories/1059970474> [https://perma.cc/8TP8-5RTY]); see *id.* § 10:11, at 111 (“[In a 2011 U.S. House of Representatives Committee on Energy and Commerce report,] some oil and gas companies stated they did not have access to proprietary information about chemicals they bought directly from suppliers: ‘In these cases, the companies are injecting fluids containing chemicals that they themselves cannot identify.’” (quoting MINORITY STAFF OF H. COMM. ON ENERGY & COMMERCE, 112TH CONG., CHEMICALS USED IN HYDRAULIC FRACTURING 2 (2011))); PRUD'HOMME, *supra* note 166, at 83–84.

180. See MILGRIM, *supra* note 4, § 1.01 (“The definition [of trade secret] includes information that has commercial value from a negative viewpoint, for example the results of lengthy and expensive research which proves that a certain process will *not* work could be of great value to a competitor.”); O'REILLY, *supra* note 168, §§ 10:1–10:2, at 102–03 (“Halliburton claimed that disclosure of its secret chemical formulas would cost it \$375 million. . . . One might presume that trial and error with differing levels and types of chemical ingredients has costs Knowing what will work or what has not worked is ‘know-how’ that has an inchoate value.”).

181. O'REILLY, *supra* note 168, § 10:3, at 104 (“The federal laws can allow a federal agency over-ride of a company's claim of confidential status for its chemicals. The health and safety for the persons exposed to the mixture of chemicals may be in jeopardy. This risk scenario is a sufficient reason why the identities of chemicals should be disclosed.” (citations omitted)).

Act; the Comprehensive Environmental Response, Compensation, and Liability Act (or “Superfund”); the National Environmental Policy Act; and the Toxic Release Inventory under the Emergency Planning and Community Right to Know Act.¹⁸² This leaves the United States with a “patchwork” of state disclosure requirements, many of which offer little—if any—protection to the public.¹⁸³

In February 2014, the Secretary of Energy Advisory Board advised the full disclosure of chemicals, proposing that companies *could* publicly disclose all chemicals without revealing the exact formula. In this regard, several companies have listed chemicals on the industry website FracFocus.org.¹⁸⁴ In October 2014, Houston-based oil-field service company Baker Hughes began listing all of the chemicals it uses, without detailing specific percentages or amounts.¹⁸⁵ The company’s chief strategy officer explained that

182. William J. Brady & James P. Crannell, *Hydraulic Fracturing Regulation in the United States: The Laissez-Faire Approach of the Federal Government and Varying State Regulations*, 14 VT. J. ENVTL. L. 39, 43 (2012) (citing RENEE LEWIS KOSNIK, EARTHWORKS, THE OIL AND GAS INDUSTRY’S EXCLUSIONS AND EXEMPTIONS TO MAJOR ENVIRONMENTAL STATUTES 2 (2007), <https://earthworks.org/cms/assets/uploads/archive/files/publications/PetroleumExemptions1c.pdf> [<https://perma.cc/FS85-2FNX>]); *see also* PRUD’HOMME, *supra* note 166, at 70, 107 (“[W]hen the [Department of Interior] issued a new set of hotly anticipated rules governing hydrofracking on public lands in May 2013, environmentalists were dismayed. The new rules continue to allow energy companies to keep certain fracking chemicals secret . . .”).

183. PRUD’HOMME, *supra* note 166, at 84 (citing Abraham Lustgarten, *Natural Gas Drilling Is at a Crucial Turning Point*, GUARDIAN (Apr. 21, 2011, 11:09 AM), <https://www.theguardian.com/environment/2011/apr/21/natural-gas-drilling-turning-point> [<https://perma.cc/EP2S-BNBM>]). In Ohio, for example, the state fracking disclosure law “prohibits anyone from accessing information about ‘trade secret’ fracking chemicals except the Ohio Department of Natural Resources (ODNR) or doctors treating a specific patient.” *See* O’REILLY, *supra* note 168, § 10:14, at 119 (citing OHIO REV. CODE ANN. § 1509.10 et seq. (West 2015)). However, neither the ODNR nor doctors are allowed to share that information with others, including those exposed. *Id.* “In Texas, legislators passed the nation’s first rules requiring public disclosure of fracking chemicals.” *See* PRUD’HOMME, *supra* note 166, at 96 (citing Jennifer Hiller, *Frackers Avoid Fluid Disclosure Despite New Law*, STATESMAN (Feb. 9, 2013, 12:00 AM), <http://www.statesman.com/news/news/opinion/frackers-avoid-fluid-disclosure-despite-new-law/nWHKZ/> [<https://perma.cc/Q3KZ-WQHY>]). While the rules were designed to promote transparency, that was not the result. *See id.* “Between April 2011 and early December 2012, Texas drillers used terms such as ‘secret,’ ‘confidential,’ or ‘proprietary’ 10,120 times out of the 12,410 hydraulic fractures reported . . .” *Id.*

184. SEC’Y OF ENERGY ADVISORY BD., U.S. DEPT’ OF ENERGY, TASK FORCE REPORT ON FRACFOCUS 2.0, at 2 (2014), <https://energy.gov/sites/prod/files/2014/03/f8/FracFocus%20TF%20Report%20Final%20Draft.pdf> [<https://perma.cc/8MPV-CX65>]; *see* REBECCA FELIX, 12 THINGS TO KNOW ABOUT FRACKING 14–15 (2015); *see also* FRACFOCUS, <http://fracfocus.org/> [<https://perma.cc/FAD3-865M>] (last visited Mar. 19, 2018).

185. Eric Killelea, *Baker Hughes Next to Disclose Formula*, WILLISTON HERALD (Oct. 2, 2014), http://www.willistonherald.com/news/baker-hughes-next-to-disclose-formula/article_9bfd3616-4a5d-11e4-9bcd-97c1e2811492.html [<https://perma.cc/9W7T-7DGT>].

[i]ntroducing greater transparency about the chemicals used in the hydraulic fracturing process and protecting the ability to innovate are not conflicting goals. . . . [Disclosure] is consistent with our belief that we are partners in solving industry challenges, and that we have a responsibility to provide the public with the information they want and deserve. It simultaneously enables us to protect proprietary information that is critical to our growth.¹⁸⁶

Yet the industry continues to lobby the EPA to protect trade secrets by *not* requiring companies to reveal substances used in fracking, arguing that “[h]ydraulic fracturing is a highly complex and competitive industry where trade secrets are critical assets.”¹⁸⁷ As a result, trade secrecy continues to impede the public’s consideration of what appears to be a hazard to the health of humans, animals, and the environment.

B. Genetically Modified Organisms

[A]s food has become more complicated, the balance between trade secrets and public disclosure has become more complicated. On one hand, manufacturers must maintain trade secrets to protect their investments. On the other hand, consumers want to know what ingredients are in food products, as well as how those ingredients are made.¹⁸⁸

Genetically modified organisms (GMOs) are organisms whose genetic material has been altered using genetic engineering techniques.¹⁸⁹ Similarly, genetically modified foods are “plants and animals that have had their genetic makeup artificially altered . . . to make them grow faster, taste better, provide more nutrients, or last longer.”¹⁹⁰ This is done by transposing the DNA of one organism—a plant, animal, or bacterium—with another “in order to change the condition or character of the receiving organism.”¹⁹¹

There are three agencies involved in the regulation of genetically modified foods: the Food and Drug Administration (FDA),

186. *Id.*

187. *US Chemical Manufacturers Lobby for Fracking Formula Secrecy*, CHEMICALWATCH (Sept. 30, 2014), <https://chemicalwatch.com/21344/us-chemical-manufacturers-lobby-for-fracking-formula-secrecy> [<https://perma.cc/6J6C-933B>].

188. Kelly Damewood, *Food Ingredients: Trade Secrets vs. Public Disclosure*, FOOD SAFETY NEWS (Mar. 17, 2014), <http://www.foodsafetynews.com/2014/03/food-ingredients-trade-secrets-versus-public-disclosure/#.VritXfkrJD8> [<https://perma.cc/92U2-CVZA>].

189. See Julie Hill, *The Precautionary Principle and Release of Genetically Modified Organisms (GMOS) to the Environment*, in *INTERPRETING THE PRECAUTIONARY PRINCIPLE* 172, 174 (Timothy O’Riordan & James Cameron eds., 1994).

190. KEVIN HILLSTROM, *GENETICALLY MODIFIED FOODS* 8 (2012).

191. *Id.*

the Department of Agriculture (USDA), and the EPA.¹⁹² The FDA is charged with regulating GMOs that become food or drugs,¹⁹³ the USDA is charged with regulating GMOs that are existing crops,¹⁹⁴ and the EPA is charged with regulating genetically modified pesticide products.¹⁹⁵ “All three agencies operate passively under a ‘don’t tell, don’t look’ policy.”¹⁹⁶ Under this policy, the government investigates potential risks only after the industry first discloses them.¹⁹⁷

The majority of Americans think the FDA does premarket safety testing.¹⁹⁸ It does not.¹⁹⁹ In 1992, the FDA decided to consider all genetically engineered food, prior to being studied, to be generally regarded as safe (GRAS).²⁰⁰ Therefore, neither premarket testing nor FDA approval is required before sale of GMO foods.²⁰¹ Moreover,

192. See KERRY H. WHITESIDE, PRECAUTIONARY POLITICS: PRINCIPLE AND PRACTICE IN CONFRONTING ENVIRONMENTAL RISK 14 (2006); Elizabeth A. Rowe, *Patents, Genetically Modified Foods, and IP Overreaching*, 64 SMU L. REV. 859, 876 (2011).

193. CUMMINGS, *supra* note 42, at 12–13.

194. *Id.*

195. *Id.*

196. *Id.* at 13.

197. *See id.*

198. *Id.* at 14.

199. *Id.*

200. See HILLSTROM, *supra* note 190, at 18; *see also* CUMMINGS, *supra* note 42, at 14 (“If something can be ‘generally regarded as safe’ (GRAS) under the act, as most conventional foods are, then it is not regulated. Dr. Michael Hansen of Consumers Union says that the extraordinary decision by the FDA to consider all genetically engineered food, prior to being studied, to be GRAS weakens consumer safety requirements, because manufacturers no longer have to establish the safety of these products before selling them.”); Rowe, *supra* note 192, at 879–80; Erin Quinn & Chris Young, *Why the FDA Has Never Looked at Some of the Additives in Our Food*, NPR: SALT (Apr. 14, 2015, 3:28 PM), <http://www.npr.org/sections/thesalt/2015/04/14/399591292/why-the-fda-is-clueless-about-some-of-the-additives-in-our-food> [<https://perma.cc/V23M-VD8S>] (“Companies have added thousands of ingredients to foods with little to no government oversight. That’s thanks to a loophole in a decades-old law that allows them to deem an additive to be ‘generally recognized as safe’—or GRAS—without the U.S. Food and Drug Administration’s blessing, or even its knowledge. The loophole was originally intended to allow manufacturers of common ingredients like vinegar and table salt—when added to processed foods—to bypass the FDA’s lengthy safety-review process. But over time, companies have found that it’s far more efficient to take advantage of the exemption to get their products on shelves quickly. Some of these products contain additives that the FDA has found to pose dangers.”).

201. See CUMMINGS, *supra* note 42, at 14–17 (“[T]he companies only engage in a voluntary and informal ‘consultation process’ with the FDA. As a result, the GMOs that are on grocery store shelves today have never been tested for human health hazards. . . . A peer-reviewed paper published in 2004 examined nearly one hundred sources, including regulatory documents and unpublished studies by industry, and concluded that approval in the United States is ‘a rubber-stamp process’ designed to ‘increase public confidence in, but not ensure the safety of, genetically engineered foods.’”); *see also* WHITESIDE, *supra* note 192, at 15; Rowe, *supra* note 192, at 879–80 (“[N]either premarket testing nor FDA approval is required before genetically modified plant foods are sold to consumers.”).

labels are not required²⁰² because GMO foods are not considered by the FDA to be “substantially different from their conventional counterparts.”²⁰³

No one, including insurers,²⁰⁴ wants to take responsibility for the safety of GMOs. The FDA claims that “it is the food producer who is responsible for assuring safety.”²⁰⁵ Meanwhile, Monsanto states that it “should not have to vouchsafe the safety of biotech food. Our interest is in selling as much of it as possible. Assuring its safety is the FDA’s job.”²⁰⁶

The agrochemical and agrobiotech industries are a political force, ever-increasing in power.²⁰⁷ Monsanto and other agrochemical or agrobiotech companies, like Dow, DuPont, and Syngenta, all have “a long history in the chemical business and a lot of experience avoiding government regulation.”²⁰⁸ Based on successful lobbying efforts, the industry was able to effectively exempt itself from the “most important environmental and consumer protection laws.”²⁰⁹ Yet

202. See CUMMINGS, *supra* note 42, at 16 (“Even though public-opinion polls repeatedly show that well over 90 percent of Americans want labels on genetically engineered foods, those labels are not allowed.”).

203. Rowe, *supra* note 192, at 879–80; see also CUMMINGS, *supra* note 42, at 15 (“Early on, [agencies] made a preemptive decision to approve all GMOs on the basis of a concept known as ‘substantial equivalence.’ The biotechnology industry created a blanket exemption for its products by simply declaring, without any scientific basis, that those products were the same as their natural counterparts.”); WHITESIDE, *supra* note 192, at 16 (“Having found GM food to be ‘substantially equivalent’ to conventionally grown food, the FDA argues that there is no need for it to carry out an assessment of every GM food product.”).

204. See WHITESIDE, *supra* note 192, at 51 (“It is a powerful indication that we are not in the domain of traditional risk management when insurers refuse to cover the potential damages from transgenic crops, claiming that too little is known about their effects for them to calculate coverage.”).

205. CUMMINGS, *supra* note 42, at 16.

206. *Id.*

207. See *id.* at 20 (“Responsibility for the lack of meaningful regulation lies with the agrochemical companies, with the regulators, and with those scientists who from the beginning wanted to avoid public scrutiny. . . . Their decision to regulate themselves facilitated the industry’s success with politicians, who were then easily persuaded to go along with self-regulation.”); WHITESIDE, *supra* note 192, at 96 (“The industry shapes its own regulatory environment.”).

208. CUMMINGS, *supra* note 42, at 12 (“The dismantling of the U.S. regulatory system was a key element in the agrochemical industry’s successful strategy to impose GMOs on the marketplace. Much of the controversy surrounding genetically engineered plants can be attributed to the fact that they are not effectively regulated and the public has no way of knowing whether or not they are safe. Agrobiotechnology has been commercialized by companies like Dow, DuPont, Syngenta, and Monsanto, all of which have a long history in the chemical business and a lot of experience avoiding government regulation.”); see also WHITESIDE, *supra* note 192, at 16 (“The whole process of designing regulatory structures was closed to the public and largely shaped by the very industry that was to be regulated.”).

209. See CUMMINGS, *supra* note 42, at 16.

many trade secret owners have previously shown themselves not to be concerned with public health, but rather with making money and avoiding responsibility for any harm they cause.²¹⁰ Nevertheless, under current laws and regulations, companies decide what research information and data to share, often designating the information they do share as “trade secrets.”²¹¹

As a result, companies presently “engage in a voluntary and informal consultation process with the FDA,”²¹² such that GMOs in grocery stores (which include 80 percent of the processed foods sold) “have never been tested for human health hazards.”²¹³ Because the FDA’s policy is to neither test nor label GMOs, “the feeding trials are taking place at our dinner tables.”²¹⁴

GMOs may pose long-term hazards to human health and the environment.²¹⁵ Among other illnesses,²¹⁶ food-related diseases have doubled since the introduction of GMOs,²¹⁷ and food allergies are rising rapidly.²¹⁸ Further, there has been “an increased risk of cancer from elevated levels of the IGF-1 factor in milk from cows treated with Monsanto’s genetically engineered bovine growth hormone.”²¹⁹

Additionally, herbicide use has increased dramatically since herbicide-resistant GMO crops were planted.²²⁰ Herbicides are known to pollute the environment and to “cause health problems for humans and animals.”²²¹ In light of the increased herbicides and the fact that

210. See *id.* at 19 (“Corporations are about making money, not moral decisions.”); see *supra* Part IV.

211. Rowe, *supra* note 192, at 877.

212. CUMMINGS, *supra* note 42, at 14.

213. *Id.* at 14, 20.

214. *Id.* at 40–41.

215. Hill, *supra* note 189, at 177–78.

216. See *Secrecy Still Protects Genetically Modified Foods from Disclosure*, CTR. FOR EFFECTIVE GOV’T (Jan. 10, 2012), <http://www.foreffectivegov.org/node/11944> [<https://perma.cc/3C9M-VCWY>] (“In 2009, the American Academy of Environmental Medicine highlighted several animal studies that indicated serious health risks associated with GE [genetically engineered] food, including infertility, immune system problems, accelerated aging, faulty insulin regulation, and changes in major organs and the digestive system.”).

217. See CUMMINGS, *supra* note 42, at 39 (“A study in Ireland showed that food-related diseases doubled during the same time that GMO food was introduced.”).

218. See *id.* (“GMOs are novel proteins that have never been in the human diet before, and allergies are rising everywhere.”); *Secrecy Still Protects Genetically Modified Foods from Disclosure*, *supra* note 216 (“[T]ests show that GE crops can induce allergies.”).

219. CUMMINGS, *supra* note 42, at 39–40; see also STEEL, *supra* note 53, at 205–11.

220. CUMMINGS, *supra* note 42, at 30 (“The most widely grown GMO crop is Monsanto’s Roundup Ready soybean, a soybean engineered to withstand being sprayed with Monsanto’s best-selling herbicide, Roundup.”).

221. *Id.*

industry is feeding GMO corn to animals,²²² it is not surprising that dozens of animal studies show serious health problems associated with GMOs.²²³

When side effects occur in humans, the tort system does not provide an effective remedy.²²⁴ Because consumers generally do not know whether they have consumed a genetically modified product, “it becomes very difficult to establish a causal connection between the product and any resulting injury. Moreover, without the requisite [information], it is almost impossible for a plaintiff to show that the risk of harm was foreseeable.”²²⁵

Meanwhile, Japan, New Zealand, and the European Union have banned genetically modified ingredients,²²⁶ and “over 60 countries around the world require labeling of GMOs, including Russia, India, [and] even China.”²²⁷ Yet, in the United States, agrochemical and agrobiotech companies have spent millions to convince the public that genetically modified foods are good while refusing to disclose the studies that have actually been conducted.²²⁸

VI. CURRENT METHODS ARE INSUFFICIENT

As evidenced by historical examples and current concerns, it is clear that regulations, laws, whistleblowers, the press, the police, and the courts are no match for companies hiding dangerous trade secrets. As things now stand, the public must wait until actual harm appears

222. See *FOOD, INC.* 21:12 (Magnolia Pictures, Participant Media & River Road Entertainment 2008).

223. See CUMMINGS, *supra* note 42, at 40.

224. See Rowe, *supra* note 192, at 881–82.

225. *Id.*; see also WHITESIDE, *supra* note 192, at 17 (“[T]he undeclared mixing of GM and non-GM products . . . obliterate[s] the possibility of detecting early warning signs of health or environmental danger. . . . [I]f after a number of years, any of the potential risks to human health do happen to materialize, it will be extremely difficult to discover the role of the transgenic product in the risk and then remove the product from distribution.”).

226. HILLSTROM, *supra* note 190, at 23; see also Nigel Haigh, *The Introduction of the Precautionary Principle into the UK*, in INTERPRETING THE PRECAUTIONARY PRINCIPLE, *supra* note 189, at 229, 241 (“The control of genetically modified organisms is one area going beyond traditional pollution control where, as a result of EC legislation, the precautionary principle is embodied in UK legislation.”).

227. GMO OMG (Compeller Pictures, Heartworn Pictures & Nature’s Path 2013).

228. See CUMMINGS, *supra* note 42, at 62 (“There are reports of rigged crop trials and inadequate and unreliable industry statements to regulators, and many anecdotes about how the biotechnology industry has tried to smear its critics. . . . Chuck Benbrook[,] . . . one of the few independent economists who, using publicly available data, has shown that agricultural genetic engineering is not living up to its promises . . . said . . . ‘The level of intellectual dishonesty in the discourse on GM crops . . . [is] an indicator that we are losing the ability of critically evaluating the choices that we need to make, as a society.’”).

before anything can be done about it.²²⁹ And even after the public discovers the harm, it often takes many years to partially remediate the situation.²³⁰ Full remediation will likely never occur.²³¹

Through lobbying efforts, the industries are essentially regulating themselves,²³² and such self-regulation is not working. Corporations focus on the bottom line, often at the expense of public health and safety.²³³ Many corporations are governed by a powerful elite that stresses silence and loyalty. They and their obedient members are impervious to outside criticism.²³⁴ They take risks for one another and the organization, collectively agreeing to questionable actions that no one individual would take on his or her own.²³⁵ And given the various legal protections available, officers and directors face little personal risk.²³⁶

Regulations and laws include exceptions for trade secrets,²³⁷ such that “the name of the chemical, its manufacturer, intended uses, and production quantities are withheld as confidential business information” (CBI).²³⁸ One seemingly well-intentioned reform bill to

229. See Kelly, *supra* note 59 (“With no mandatory safety testing for the vast majority of the tens of thousands of chemicals used daily in America, doctors and public health officials have little information to guide them as they seek to identify potential health hazards[.]”).

230. See STEEL, *supra* note 53, at 73 (“[T]he harm to human health or the environment persists for decades or more even after the activity generating the harm ceases.”).

231. See BOK, *supra* note 1, at 272–73 (“There may be no victims ready to come forward or visibly injured because no one in effect feels victimized In toxic-waste disposal or embezzlement, . . . there are persons who would feel victimized if they knew about the crime, but who file no complaint since they are unaware of it.”).

232. See sources cited *supra* note 207.

233. See Rich, *supra* note 56 (reporting that rather than developing an alternative that would be “less toxic and stay[] in the body for a much shorter duration,” DuPont decided to continue using PFOA because “[t]he risk was too great: Products manufactured with PFOA were an important part of DuPont’s business, worth \$1 billion in annual profit.”); *Trade Secrets: A Moyers Report*, *supra* note 54, at 53:47–54:00 (“Instead of changing its behavior, the petrochemical industry turned to the courts to stop the regulation. The companies argued that reducing exposure to benzene would be too costly.”).

234. See BOK, *supra* note 1, at 25, 123, 147, 173.

235. See *id.*

236. See 1 WILLIAM E. KNEPPER & DAN A. BAILEY, *LIABILITY OF CORPORATE OFFICERS AND DIRECTORS* § 2.01 (8th ed. 2017). For example, the business judgment rule presumes that officers and directors act in the best interests of the corporation; it protects them from liability for acts of negligence. *Id.* Likewise, directors and officers can obtain liability insurance that will indemnify them for defense costs. 2 KNEPPER & BAILEY, *supra*, § 23.03.

237. See 5 U.S.C. § 552(b)(4) (2012); see also MILGRIM, *supra* note 4 at § 12.03.

238. Sharon Lerner, *A Chemical Shell Game: How DuPont Concealed the Dangers of the New Teflon Toxin*, INTERCEPT (Mar. 3, 2016, 2:51 PM), <https://theintercept.com/2016/03/03/how-duPont-concealed-the-dangers-of-the-new-teflon-toxin/> [<https://perma.cc/5LSR-RSUZ>] (“When companies want to begin making and selling a new chemical, they are required to file a written notice with the EPA. But current regulations do not mandate that any particular health or safety studies be performed, and according to a 2007 report from the EPA, only 15 percent of new

the Toxic Substances Control Act would have actually caused more damage if it had passed, as it would have “allow[ed] companies to claim chemical identity in health studies as CBI.”²³⁹

Some laws, such as the Defend Trade Secrets Act of 2016 (DTSA),²⁴⁰ include provisions that aim to protect whistleblowers;²⁴¹ however, whistleblowers have historically not received adequate protection.²⁴² “If those in charge knowingly manufacture unsafe products or engage in corporate bribery, then the open-door policy is but a trap for the outspoken; even when employees suffer no reprisal for having voiced a criticism to management, they will usually find that it has simply been ignored.”²⁴³ There are too many ways for

chemical notices contain any information about the materials’ impact on health. Moreover, chemical manufacturers are permitted to claim that various parts of the information they give the EPA are ‘confidential business information,’ or CBI. About 95 percent of new chemical notifications, according to a 2005 Government Accountability Office report, include information that is protected as a trade secret, a figure the EPA confirmed as still ‘generally accurate.’ . . . Manufacturers have used the CBI shield to withhold the names and identities of 17,585 of the chemicals now registered with the EPA.”).

239. *Id.* (“Chemical manufacturers are required by Section 8 (e) of the Toxic Substances Control Act to report any information to the EPA that ‘reasonably supports the conclusion that’ a substance they make or use ‘presents a substantial risk of injury to health or the environment.’ But the critical information in these 8 (e) reports can also be claimed as confidential.”).

240. Defend Trade Secrets Act of 2016, Pub. L. No 114-153, § 7, 130 Stat. 376, 384–85 (2016) (codified at 18 U.S.C. § 1833(b)(1)(A)(ii) (2016)) (providing “[i]mmunity from liability for confidential disclosure of a trade secret to the Government or in a court filing . . . for the purpose of reporting or investigating a suspected violation of law”).

241. *See* BOK, *supra* note 1, at 211 (“‘Whistleblower’ is a recent label for those who . . . make revelations meant to call attention to negligence, abuses, or dangers that threaten the public interest.”).

242. *See, e.g.,* Walleri v. Fed. Home Loan Bank, 83 F.3d 1575, 1581–82 (9th Cir. 1996) (denying plaintiff-whistleblower’s claim for retaliatory discharge because she did not report the violations to the proper authority); Moor-Jankowski v. Bd. of Trs. of N.Y. Univ., No. 96 CIV. 5997(JFK), 1998 WL 474084, at *11 (S.D.N.Y. Aug. 10, 1998) (dismissing plaintiffs-whistleblowers’ claims because they did not engage in protected activity of which defendants were aware); Adler v. Am. Standard Corp., 432 A.2d 464, 472 (Md. 1981) (conceding that plaintiff-whistleblower had exposed serious misconduct, the court denied him protection for failure to recite with sufficient specificity how the defendant-employer had violated specific statutes); Luethans v. Wash. Univ., 894 S.W.2d 169, 172–73 (Mo. 1995) (granting summary judgment to defendant because plaintiff-whistleblower was a contract employee, rather than an at-will employee), *abrogated by* Keveney v. Mo. Military Acad., 304 S.W.3d 98 (Mo. 2010); Kern v. DePaul Mental Health Servs., Inc., 544 N.Y.S.2d 252, 252–53 (App. Div. 1989) (dismissing plaintiff-whistleblower’s claim because defendant’s actions “did not create and present a substantial and specific danger to the public health and safety”); Maus v. Nat’l Living Ctrs., Inc., 633 S.W.2d 674, 675, 677 (Tex. App. 1982) (affirming judgment refusing to award damages to appellant-whistleblower because she was an at-will employee); *see also* Martin H. Malin, *Protecting the Whistleblower from Retaliatory Discharge*, 16 U. MICH. J.L. REFORM 277, 277 (1983).

243. BOK, *supra* note 1, at 226; *see also* Malin, *supra* note 242, at 286 (“The whistleblower must expect employer retaliation and weigh the consequences in deciding whether to act . . .”).

employers to penalize whistleblowers without detection.²⁴⁴ Furthermore, the whistleblower bears the burden of proof.²⁴⁵

Likewise, the First Amendment's freedom of the press²⁴⁶ cannot protect the public from dangerous trade secrets. After all, the media cannot shed light on what it cannot see.²⁴⁷ Moreover, when the media becomes aware of certain information, it often serves commercial interests.²⁴⁸

Additionally, the US criminal justice system does not treat criminals from different social backgrounds equally.²⁴⁹ As such, laws relating to white-collar crime (e.g., toxic waste violations) do not have enough teeth to counter the use of trade secrets that damage the public health.²⁵⁰ Further, such abuses are hard to detect if no one brings a complaint.²⁵¹ Ordinary police methods therefore "do not serve well against such crimes."²⁵²

Civil litigation is also not an effective solution, as victims are often unaware of the cause of their injuries²⁵³ and, even if they

244. See BOK, *supra* note 1, at 212, 227. While demotion, dismissal, salary reduction, and job reassignment are noticeable adverse actions, retaliation can also be more subtle (e.g., denial of promotion, negative evaluation, increased surveillance, ostracizing the employee, hostile remarks). See *Ray v. Henderson*, 217 F.3d 1234, 1241–42 (9th Cir. 2000).

245. See *Hicks v. Baines*, 593 F.3d 159, 164 (2d Cir. 2010); *Ray*, 217 F.3d at 1240; 1 EDWARD T. ELLIS & GREGORY C. KEATING, *WHISTLEBLOWING AND RETALIATION* § 2.1 (2016).

246. U.S. CONST. amend. I ("Congress shall make no law . . . abridging the freedom of . . . the press.").

247. See 5 U.S.C. § 552(b)(4) (2012). The Freedom of Information Act includes nine exemptions, including but not limited to "trade secrets," "privileged or confidential" information, or "commercial or financial information." *Id.*

248. See BOK, *supra* note 1, at 264 ("The press and other news media rightly stand for openness in public discourse. . . . Yet the media serve commercial and partisan interests in addition to public ones; and media practices of secrecy, selective disclosure, and probing should not be exempt from scrutiny."); Esther Gal-Or, Tansev Geylani & Tuba Pinar Yildirim, *The Impact of Advertising on Media Bias*, 49 J. MARKETING RES. 92, 96–97, 99 (2012).

249. See BOK, *supra* note 1, at 269; Cedric Michel, *Violent Street Crime Versus Harmful White-Collar Crime: A Comparison of Perceived Seriousness and Punitiveness*, 24 CRITICAL CRIMINOLOGY 127, 138 (2016).

250. See BOK, *supra* note 1, at 269 ("The burden of white-collar crime is immense; through the corruption of a few, it weighs on all citizens. White-collar or economic crime encompasses such activities as tax fraud, bribery, labor racketeering, arson-for-profit, insurance fraud, and toxic-waste violations. It has been estimated to cost the nation ten times as much as all the street crimes . . . put together . . .").

251. See *id.* at 273.

252. See *id.*

253. See BOK, *supra* note 1, at 272–73 ("In toxic-waste disposal or embezzlement, on the other hand, there are persons who would feel victimized if they knew about the crime, but who file no complaint since they are unaware of it."); *Trade Secrets: A Moyers Report*, *supra* note 54, at 46:38–46:58 ("No public warning was issued. Now, 30 years later, those hairdressers and their customers are unaware of the risks to which they were exposed. And it is impossible to know how many women may have been sick or died—without knowing why.").

surmise such liability, they do not have the proof needed.²⁵⁴ For diseases related to chemical exposure, moreover, the long-term onset of the illness may present additional hurdles to recovery, such as statutes of limitations and intervening bankruptcies.²⁵⁵ In the rare situation when someone actually gets close to proving his or her claims, the company offers a settlement under a strict nondisclosure agreement.²⁵⁶

When cases actually go to trial, the court system has generally not been effective. In fact, some courts have held that the general public interest in revealing trade secrets was minimal because the transfer of the secret between private commercial parties did not prejudice the public.²⁵⁷ However, when the exchange is no longer

254. See AGENCY FOR TOXIC SUBSTANCES & DISEASE REGISTRY, U.S. DEPT OF HEALTH & HUMAN SERVS., CS218078-A, CHEMICALS, CANCER, AND YOU 3, <https://www.atsdr.cdc.gov/emes/public/docs/Chemicals,%20Cancer,%20and%20You%20FS.pdf> [https://perma.cc/3HTV-S4DZ] (last visited Apr. 3, 2018) (“Getting cancer from a chemical depends on . . . [t]he kind of chemical you were exposed to, [h]ow much of the chemical you were in contact with, [h]ow long the contact lasted, [h]ow often you were exposed, [w]hen you were exposed, [h]ow you were exposed, and [y]our general health.”); Rowe, *supra* note 192, at 881–82 (“With genetically modified foods, however, the tort system is not a feasible option. Since consumers are generally unaware that they have even consumed a genetically modified food, it becomes very difficult to establish a causal connection between the product and any resulting injury. Moreover, without the requisite research to evaluate genetically modified foods, it is almost impossible for a plaintiff to show that the risk of harm was foreseeable, or conversely, independent research could also reveal that the products pose very little risk.”); Laura Lorenzetti, *The Roundup Problem: Why It’s So Hard to Pinpoint What Causes Cancer*, FORTUNE (Apr. 15, 2015), <http://fortune.com/2015/04/15/roundup-monsanto-cancer-link-hard-to-prove/> [https://perma.cc/RK7W-WQ3R].

255. See Thomas J. Martin, *Long-Term Liability for Hazardous Waste Induced Injury in Missouri: Latent Harm Sufferers Beware*, 28 WASH. U. J. URB. & CONTEMP. L. 299, 304–05, 305 n.26, 313 (1985).

256. See Ronald L. Burdge, *Confidentiality in Settlement Agreements Is Bad for Clients, Bad for Lawyers, Bad for Justice*, GP SOLO, Nov.–Dec. 2012, at 25, 25, https://www.americanbar.org/publications/gp_solo/2012/november_december2012privacyandconfidentiality/confidentiality_settlement_agreements_is_bad_clients_lawyers_justice.html [https://perma.cc/ARA4-PFKG] (“Confidentiality prevents the public from knowing about systemic wrongful conduct. It can also prevent regulators and government agencies from performing their duty to enforce the law and protect the public. The purpose of the court is to evenly administer justice to all so that all are protected by the law. When violations are hidden by confidentiality, the legal system itself is thwarted from fulfilling one of its fundamental purposes: to protect the citizenry from wrongful conduct.”).

257. See Levine, *supra* note 49, at 148–49; see also Philip Morris, Inc. v. Reilly, 312 F.3d 24, 44 (1st Cir. 2002) (“[F]or a state to be able to completely destroy valuable trade secrets, it should be required to show more than a possible beneficial effect.”); *In re Denture Cream Prods. Liab. Litig.*, No. 09-2051-MD, 2013 WL 214672, at *10 (S.D. Fla. Jan. 18, 2013) (deciding that the corporation’s interests in protecting the information outweighed the public’s interest, stressing that the lack of any FDA request for the information undermined the plaintiff’s argument that disclosure was necessary because of great public health and safety concerns, and reasoning that if the FDA did not need the information, then it must not be important); Van Etten v. Bridgestone/Firestone, Inc., 117 F. Supp. 2d 1375, 1384 n.4 (S.D. Ga. 2000) (finding, in a case

between private commercial parties, but involves the public, the public interest becomes strong.²⁵⁸ Unfortunately, courts have failed to keep up with this shift. The result is that, under the traditional view of trade secrecy law, no one can examine the relevant information because it must be strictly hidden from the public.²⁵⁹

Suffice it to say, change is needed. However, “it is important to recognize and balance the interests of all the stakeholders involved.”²⁶⁰ While investment in research and development should be protected, the public’s interest should also be safeguarded.²⁶¹ The question then becomes, What should be changed? Part VII discusses some previously offered, yet ineffective, solutions; thereafter, Part VIII offers a recommendation.

VII. OTHERS’ SUGGESTIONS

The dilemma of companies concealing dangerous ingredients as trade secrets—choosing profits over public health and environmental welfare—is not a new one. Many legislators, scholars, and journalists have grappled with the issue. And while no perfect solution has been offered, their actions and proposals should be considered and, where helpful to solving the dilemma, built upon.

Certainly, more could be done to protect human health and the environment, such as requiring those with legislative or regulatory influence “to reveal their ties to the relevant industries,” widen the

involving negligent design or manufacture of car tires, that “concerns of public health and safety trump any right to shield [trade secret] material from public scrutiny”), *vacated sub nom.* Chi. Tribune Co. v. Bridgestone/Firestone, Inc., 263 F.3d 1304, 1313 (11th Cir. 2001) (finding no trade secret and explaining the “good cause” test, wherein the party seeking document protection must show that its interests in keeping the information secret outweigh the opposing party’s interest in obtaining the information); *Masonite Corp. v. Cty. of Mendocino Air Quality Mgmt. Dist.*, 49 Cal. Rptr. 2d 639, 648 (Ct. App. 1996) (holding that California’s Air Toxics “Hot Spots” Information and Assessment Act of 1987 favored granting trade secret status over disclosure to the public, thus the exemptions granted “[were] absolute, and [did] not depend upon a further balancing of harm to the public”).

258. See Levine, *supra* note 49, at 148–49; see also *Ruckelshaus v. Monsanto Co.*, 467 U.S. 986, 1007 (1984) (holding that loss of trade secrets is not a taking when one receives an economic advantage for it); *Corn Prods. Ref. Co. v. Eddy*, 249 U.S. 427, 431–32 (1919) (“The right of a manufacturer to maintain secrecy as to his compounds and processes must be held subject to the right of the state, in the exercise of its police power and in promotion of fair dealing, to require that the nature of the product be fairly set forth.”).

259. See Levine, *supra* note 49, at 151 (“[U]nder trade secrecy law there is no opportunity for the general public to easily examine information deemed secret.”); *id.* at 190 (“[C]ourts have had a difficult time determining what a ‘public concern’ is for purposes of First Amendment protection of disclosure.”).

260. Rowe, *supra* note 192, at 891–92 (addressing patent protection, as opposed to trade secrets).

261. See *id.*

regulatory process “to include a range of specialists,” “seek[] greater citizen participation in the regulatory process,” and “mandate[] the labeling and traceability of the novel products.”²⁶²

In terms of legislation, California often leads the way when it comes to protecting consumers and the environment.²⁶³ For example, in October 2013, California enacted the Safer Consumer Product (SCP) regulations.²⁶⁴ The regulations identify approximately 1,200 chemicals as “chemicals of concern,” such that manufacturers are required to disclose products containing these chemicals.²⁶⁵ However, as with other laws, these regulations carve out some exceptions for trade secrets.²⁶⁶ Less than five months after the regulations’ effective date, “trade secret” was already listed as an ingredient in 1,445 products.²⁶⁷ Thus, while legislators have admirable goals in mind—namely, protecting their citizens from toxic chemicals²⁶⁸—the trade secret carve-outs in those laws (as with the laws discussed in Parts IV and V above) curtail the state and federal governments’ abilities to meet such goals.

262. WHITESIDE, *supra* note 192, at 22–24, 120 (“Precautionary measures may include things like additional research, labeling requirements, and creating new regulatory agencies.”).

263. See Daniel Corbett & Mark Mermelstein, *Green Chemistry and Trade Secrets: California Leads Chemical Disclosure Movement, As Companies Wrestle with Options for Protection*, ORRICK: TRADE SECRETS WATCH (Feb. 14, 2014), <http://blogs.orrick.com/trade-secrets-watch/2014/02/14/green-chemistry-and-trade-secrets-california-leads-chemical-disclosure-movement-as-companies-wrestle-with-options-for-protection/> [<https://perma.cc/RU3V-6D5P>]; Ronald White, *New California Regulations Lead the Way in Protecting Consumers from Toxic Chemicals*, CTR. FOR EFFECTIVE GOV’T: CITIZEN HEALTH & SAFETY (Oct. 8, 2013), <http://www.foreffectivegov.org/new-california-regulations-lead-way-protecting-consumers-toxic-chemicals> [<https://perma.cc/Q98D-6PGP>]; see also Chris Conley, *California Leads on Electronic Privacy. Other States Must Follow.*, ACLU: SPEAK FREELY (Oct. 13, 2015, 5:15 PM), <https://www.aclu.org/blog/privacy-technology/internet-privacy/california-leads-electronic-privacy-other-states-must> [<https://perma.cc/45B2-NXMW>] (regarding electronic privacy); Abby Goodnough, *California Tries to Guide the Way on Health Law*, N.Y. TIMES (Sept. 14, 2012), <http://www.nytimes.com/2012/09/15/health/policy/california-tries-to-lead-way-on-health-law.html> [<https://perma.cc/28E2-MC62>] (regarding healthcare); Katrina vanden Heuvel, Opinion, *Once Again, California Leads the Way*, WASH. POST (Dec. 8, 2015), https://www.washingtonpost.com/opinions/once-again-california-leads-the-way/2015/12/08/3bdc8cf4-9d0a-11e5-8728-1af6af208198_story.html?utm_term=.1335484a7ae0 [<https://perma.cc/2TNA-C3QY>] (regarding climate change).

264. CAL. CODE REGS. tit. 22, § 69501(a) (2018).

265. See Corbett & Mermelstein, *supra* note 263; see also CAL. CODE REGS. tit. 22, § 69502.2(a); *Candidate Chemicals List*, CAL. DEPT TOXIC SUBSTANCES CONTROL, <http://www.dtsc.ca.gov/SCP/CandidateChemicals.cfm> [<https://perma.cc/XQM8-PT4R>] (last visited Mar. 5, 2018).

266. CAL. CODE REGS. tit. 22, §§ 69509, 69505.7(a)(4).

267. Corbett & Mermelstein, *supra* note 263.

268. See *id.* (“At least 33 states are considering new regulations of toxic chemicals in products.”).

Some scholars have proposed eliminating trade secret protection altogether and instead requiring technical information to be solely protected by patents.²⁶⁹ In this regard, it could be argued that technical protection should be preempted by the current patent law, the America Invents Act of 2011.²⁷⁰ In 1974, the last time the US Supreme Court examined this issue, it was reviewing the Patent Act of 1952 against Ohio's common law-based trade secret law that, at the time, required use—as opposed to the UTSA (adopted in Ohio in 1994) or the DTSA, neither of which require use.²⁷¹ Therefore, if a case becomes available for a plaintiff to make this argument, then it would be interesting to see whether and how the Supreme Court would rule on the preemption issue based on the new laws. Unfortunately, neither the public nor the environment can wait for that possibility.

Wendy Wagner argues that “[t]he most sweeping way to address this problem would be for Congress to make it illegal to invoke trade secret and other protections to classify information about the adverse effects of products and activities that threaten public health and the environment.”²⁷² She states that “[a] requirement mandating the reporting of all health-related information (including the chemical compositions of products and wastes) could be enforced with both civil and criminal sanctions and levied against any party involved in producing or concealing information.”²⁷³

Focusing on the use of trade secrets in the public infrastructure,²⁷⁴ David Levine proposes several partial solutions that

269. E.g., Levine, *supra* note 49, at 170 (“[T]he better option is to severely limit, or eliminate entirely, the application of the doctrine [when dealing with public infrastructure].”); *id.* at 177 (“[A]bandonment of secrecy as a business strategy may also benefit the businesses themselves”); *id.* at 187–88 (“The basic solution is to abandon trade secrecy altogether and simply require commercial public infrastructure providers to find their protection in patent.”).

270. Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (codified as amended at scattered sections of 35 U.S.C.).

271. *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 474 (1974) (discussing Ohio trade secret law, which originated from the *Restatement of Torts*, in light of the 1952 Patent Act and finding that “Ohio’s law of trade secrets is not preempted by the patent laws of the United States”); see 18 U.S.C. § 1839(3), (4) (2012); UNIF. TRADE SECRETS ACT § 1(4), § 1 cmt. (amended 1985), 14 U.L.A. 538 (2005) (“The definition of ‘trade secret’ contains a reasonable departure from the *Restatement of Torts* (First) definition which required that a trade secret be ‘continuously used in one’s business.’ The broader definition in the proposed Act extends protection to a plaintiff who has not yet had an opportunity or acquired the means to put a trade secret to use.”); ROWE & SANDEEN, *supra* note 30, at 41 (“Among the main differences between the earlier *Restatement of Torts* definition of a trade secret and the more modern [Uniform Trade Secrets Act] and *Restatement (Third) of Unfair Competition* definitions are that the latter do not require that the secret be ‘in use’ by the owner in order to qualify for protection.”).

272. Wagner, *supra* note 48, at 1726–27.

273. *Id.* at 1727.

274. See generally Levine, *supra* note 49.

would increase transparency: (1) narrowing the definition to that which “is actually used in commerce or where its disclosure would pose an immediate threat to the security of the infrastructure itself”; (2) limiting the duration of trade secrecy; and (3) changing the remedies allowed by limiting relief to monetary damages and “denying injunctive relief for the misappropriation or innocent release of public infrastructure trade secrets.”²⁷⁵ The suggestion to amend the definition of trade secret law²⁷⁶ is well taken; however, the limitation to infrastructure alone will not solve the dilemma posed herein.

Elizabeth Rowe takes a similar tack regarding food-related patents.²⁷⁷ She “concludes that, on balance, the public interest in promoting independent research on the health and safety effects of foods should outweigh the patent holder’s interest in controlling the state of adverse information available about its product.”²⁷⁸ Her article recommends “that courts use a ‘patent overreach’ doctrine to rein in” patent law’s limitation of access and restriction of research where public health and safety may be threatened.²⁷⁹ She also calls for a greater discussion “about reconciling patenting with public policy, and patenting with science and research” because Congress and the courts should evaluate patent law’s role “in limiting, rather than promoting, the progress of science, especially when public health and safety is implicated.”²⁸⁰ Although patent protection is rooted in the Progress Clause²⁸¹ and federal trade secret protection is rooted in the Commerce Clause,²⁸² Rowe’s logic could and should be applied to

275. *Id.* at 191–92.

276. *Id.* (“[T]he commercial definition of a trade secret could be narrowed . . . to only apply to information that is actually used in commerce or where its disclosure would pose an immediate threat to the security of the infrastructure itself.”).

277. *See* Rowe, *supra* note 192, at 892–93.

278. *Id.* at 892.

279. *Id.* at 862, 892. “[T]he primary concern of the patent system is the public interest.” *Id.* at 882–83 (citing *United States v. Line Material Co.*, 333 U.S. 287, 320 (1948) (Douglas, J., concurring); *Sinclair & Carroll Co. v. Interchem. Corp.*, 325 U.S. 327, 330–31 (1945)). Therefore, “[w]here patent overreaching violates our sensibilities about justice and fairness and potentially threatens public health and safety, courts . . . should take notice in order to protect the public interest.” *Id.* at 889.

280. *Id.* at 893.

281. *See* U.S. CONST. art. I, § 8, cl. 8 (granting Congress the power “[t]o promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries . . .”).

282. *See* U.S. CONST. art. I, § 8, cl. 3 (granting Congress the power “[t]o regulate Commerce with foreign Nations, and among the several States, and with the Indian Tribes.”).

trade secret law, as one of the policy goals underlying trade secret protection is the encouragement of innovation.²⁸³

Those impacted by dangerous trade secrets should have access to such information. In this regard, Sissela Bok argues that if the secret involves a practice that is harmful to the public, then it should be revealed regardless of the loss of benefits to the trade secret owner.²⁸⁴ Similarly, Levine, along with nine other law professors, sent a letter (citing Rowe's article) to the Alaska Oil & Gas Conservation Commission in October 2013, stating that

it is a basic principle in a democracy that the public shall conduct informed debate and discussion of public matters. To do this, there must be broad access to data about potential environmental, health and safety (EHS) hazards, even when the disclosure of such information might pose some pecuniary risk to the firms that are introducing the possibility of [such] risks.²⁸⁵

Finally, Philip Landrigan, Chairman of the Department of Preventative Medicine at Mt. Sinai School of Medicine, would have chemicals presumed "guilty until they are proven innocent."²⁸⁶ He asserts that this could be accomplished by creating "an unpolluted political structure that is empowered to set regulations that protect the public health."²⁸⁷ While it would be ideal to dismantle the current lobbying scheme, which enables various industries to protect their bottom line and, therefore, keep dangerous secrets hidden, that is not likely to occur anytime soon. Concrete steps need to be taken now, and the best way to do that is through trade secret law itself.

VIII. AUTHOR'S PROPOSAL: INCORPORATE THE PRECAUTIONARY PRINCIPLE INTO TRADE SECRET LAW

There are many benefits to trade secret protection, and it should not be eliminated. Inventors and businesses need to protect their investment in research and development. Thus, trade secrets

283. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481 (1974); Bok, *supra* note 1, at 147, 148.

284. Bok, *supra* note 1, at 148 ("[T]he secrecy may concern practices so harmful or invasive that they ought to be revealed, no matter how much secrecy would increase business incentives."); *id.* at 162 ("[A]s soon as a study places human subjects, laboratory workers, or bystanders at risk, the investigators can no longer claim it as their intellectual property to be revealed or kept secret as they choose.").

285. E-mail from David S. Levine, Professor, Elon Univ. Sch. of Law et al., to Cathy P. Foerster, Comm'r, Alaska Oil & Gas Conservation Comm'n, at 2-3, 9 (Oct. 14, 2013) [hereinafter Letter to Alaska Oil], http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2363099 [<https://perma.cc/CMH6-CQEJ>].

286. *Trade Secrets: A Moyers Report*, *supra* note 54, at 59:39-1:00:02.

287. *Id.*

should continue to receive protection for legitimate activities.²⁸⁸ After all, not everyone is abusing the system.

However, when trade secrets endanger others, broader public interests are at issue. Public health should take priority over commercial interests.²⁸⁹ If ongoing concealment is harmful, then it may become necessary to reveal the trade secret or at least a portion thereof.²⁹⁰ Persons who might be adversely affected by a trade secret should be provided with “specific data that describes any discharges into the environment—including chemical identity, volume and locations of each chemical discharged—and data on health and ecological effects.”²⁹¹ The scientific community is in agreement, having called for greater transparency for quite some time.²⁹²

Under current law, the trade secret owner’s practices and products are presumed safe. However, as explained above, that is often not true. In light of the historical examples of trade secret abuse, the existing concerns, and the ineffectiveness of current methods to combat such abuse, the law should be revised so that the burden of proof with regard to public health is on the trade secret owner. Creating or revising one environmental law or regulation will not fix this—trade secrets impact too many industries. Rather, trade secret law must itself be changed.

288. See BOK, *supra* note 1, at 134 (“[T]hese institutions should be able to invoke confidentiality for legitimate activities such as internal memoranda and personnel files; but it is a different matter altogether to claim confidentiality for plans that endanger others.”).

289. See *id.*; Letter to Alaska Oil, *supra* note 285, at 7 (“[T]rade secrecy should not impede disclosure of information when the information describes public risks that the trade secret claimant is itself creating.”).

290. See BOK, *supra* note 1, at 162 (“[A]s soon as a study places human subjects, laboratory workers, or bystanders at risk, the investigators [or owners of the information should] no longer [be able to] claim it as their intellectual property to be revealed or kept secret as they choose.”); Letter to Alaska Oil, *supra* note 285, at 7.

291. Letter to Alaska Oil, *supra* note 285, at 3; see also BOK, *supra* note 1, at 148; *Trade Secrets: A Moyers Report*, *supra* note 54, at 42:05–42:10 (showing a portion of an interview with Everett Hoffpauir, a former worker at Conoco, who stated, “we can’t live in a risk-free society. But we can live in an honest society.”).

292. See BOK, *supra* note 1, at 153 (“[M]odern scientists . . . have held free and open communication to be the most essential requirement for their work.”); *id.* at 170 (“Many scientists and scientific organizations have called for inquiries into the questions of responsibility and choice raised by the growing conflicts over secrecy.”); O’REILLY, *supra* note 168, § 10:13, at 115–16 (“The American Public Health Assn. has called for policies that anticipate potential public health threats, require greater transparency, and provide for monitoring as part of an overall precautionary approach towards natural gas operations.” (citing *The Environmental and Occupational Health Impacts of High-Volume Hydraulic Fracturing of Unconventional Gas Reserves*, APHA (Oct. 30, 2012), <https://www.apha.org/policies-and-advocacy/public-health-policy-statements/policy-database/2014/10/02/15/37/hydraulic-fracturing> [https://perma.cc/CZ6Q-H3HC])).

The enactment of the DTSA in 2016 created a federal private right of action for trade secret misappropriation.²⁹³ The DTSA offers an opportunity to change trade secret law across the nation in a manner that would better balance commercial interests and public health. This goal can be accomplished by incorporating the precautionary principle, which has been regularly applied internationally,²⁹⁴ into the DTSA's definition of a trade secret at 18 U.S.C. § 1839(3).

The precautionary principle, often called the “better safe than sorry” principle,²⁹⁵ “holds that governments have an affirmative duty to take preventative measures to avoid harm.”²⁹⁶ The result is that public health and welfare will be better protected from corporations that place profit above ethics. If, however, the corporation claiming trade secret protection provides sufficient evidence that its product or process will not cause harm, then it will be eligible for trade secret protection. Essentially, incorporation of the precautionary principle into the DTSA would mean that corporations must prove that their products and processes are safe in order to receive trade secret protection. This determination can and should involve third-party analysis, so as to avoid corrupted science.²⁹⁷

The precautionary principle “shifts the burden of proof to the proponents of an activity or developers of a product, to show that it

293. See Defend Trade Secrets Act of 2016, Pub. L. No. 114-153, 130 Stat. 376 (codified in scattered sections of 18 U.S.C.); see 18 U.S.C. § 1836 (2012).

294. See CUMMINGS, *supra* note 42, at 19 (“The precautionary principle is now embedded in an array of international environmental treaties, including the International Biosafety Protocol, adopted in Montreal, Canada, in 2002.”); WHITESIDE, *supra* note 192, at 19 (“Germany is usually acknowledged as the birthplace of the European version of the precautionary principle.”); *id.* at 20 (“Under Article 16, any EU member state may ‘provisionally restrict or prohibit’ the use or sale of a product if it has justifiable reason to suspect that an approved product poses a ‘risk to human health or the environment.’” (quoting David Vogel, *Ships Passing in the Night: The Changing Politics of Risk Regulation in Europe and the United States* 9 (Eur. Univ. Inst., Working Paper No. 2001/16, 2001))); *id.* at 146 (“By the year 2000, the precautionary principle had made its way into some sixteen international treaties and documents.”); Haigh, *supra* note 226, at 233 (“From the date of its entry into force (1 November 1993), the Treaty of Maastricht requires Community policy on the environment to be based on the precautionary principle.”); Hill, *supra* note 189, at 174 (“The UK Government’s 1993 Strategy for Sustainable Development states that ‘The UK adopted a precautionary approach to modern biotechnology because the lack of experience meant that it was not possible to predict the risks to humans and the environment.’”); Cordner, *supra* note 154 (“In the European Union, safety laws guarantee that both industrial and household chemicals are vetted for their potential risks to human health and the environment before they appear on the market.”); Hawthorn, *supra* note 161 (“Unlike Europe, where companies generally are required to prove the safety of their chemicals before use, U.S. law requires manufacturers to submit safety data only if they have it.”).

295. CUMMINGS, *supra* note 42, at 18–19.

296. *Id.* at 18.

297. See *supra* Parts III, IV, and V.

will not cause harm or at least to monitor and evaluate its performance over time.”²⁹⁸ It is preferable to shift this burden to those who want to gain trade secret protection, rather than expecting victims to subsequently seek compensation.²⁹⁹

We need to draw lessons from past injuries.³⁰⁰ As illustrated in Part IV above, “damages from new risks can take many years to become evident[,] and then their effects can last for generations.”³⁰¹ The precautionary principle, moreover, “is precisely for cases of serious potential danger where risks are poorly understood.”³⁰² This is even more critical when dealing with corporations that have knowingly exposed the public to dangers in the past.³⁰³

Adding the precautionary principle to the DTSA should at least curb corporations’ use of trade secrets as a shield to conceal dangers from the public. Moreover, this change to the law is likely to result in earlier detection of dangers to public health and the environment because, under the shifted burden, “uncertainty becomes the ground for additional caution, not for business as usual.”³⁰⁴ Companies’ “experiments” on the public and the environment “must be exposed to wider debate.”³⁰⁵ We have a “moral responsibility to protect future generations.”³⁰⁶

298. CUMMINGS, *supra* note 42, at 19.

299. See Timothy O’Riordan & James Cameron, *The History and Contemporary Significance of the Precautionary Principle*, in INTERPRETING THE PRECAUTIONARY PRINCIPLE, *supra* note 189, at 12, 16.

300. See WHITESIDE, *supra* note 192, at 38, 146 (“The emergence of the precautionary principle is a classic example of social learning in environmental affairs. Social learning refers to the process by which whole communities, not just individuals, draw lessons from their experiences of success and failure in dealing with challenges, gradually developing their level of moral insight and practical skill.”).

301. *Id.* at 32, 46 (“The purpose of the precautionary principle is to help us address threats that are *not immediate*—ones in which the onset of harms may be delayed for decades.”); *id.* at 89 (“The precautionary principle . . . aims at long-term, often invisible dangers . . .”); see *supra* Part IV.

302. WHITESIDE, *supra* note 192, at 49.

303. See O’Riordan & Cameron, *supra* note 299, at 18 (“[T]here ought to be a penalty for not being cautious or caring in the past. This suggests that those who have created a large ecological burden already should be more ‘precautious’ than those whose ecological footprints have to date been lighter.”); see also WHITESIDE, *supra* note 192, at 116 (“Precaution . . . mandates renewed efforts to expose commercial interests that disguise themselves as impartial science.”).

304. WHITESIDE, *supra* note 192, at 34, 102 (“The precautionary principle incites us to debate about what risks we really want to take and under what conditions.”).

305. *Id.* at 102.

306. *Id.* at 111.

Precaution is not prohibition.³⁰⁷ The incorporation of the precautionary principle into trade secret law would not prevent corporations from making certain products or using certain processes. It would, however, require them to disclose trade secrets to the public—if and only if the corporation could not demonstrate that the product or process does not endanger the public or the environment.

Inclusion of the precautionary principle need not be a barrier to development.³⁰⁸ On the contrary, precaution should result in better science and, therefore, improved performance.³⁰⁹ The precautionary principle is not designed to ask what the worst outcome might be.³¹⁰ Rather, it is concerned with existing evidence that there is a “real potential for danger.”³¹¹ If such danger exists, then the precautionary principle demands that experimentation or gradual implementation take place in order to confirm or deny the danger “before it becomes widespread or irreversible.”³¹²

To incorporate the precautionary principle into the DTSA, the definition of trade secret could be narrowed.³¹³ For example, § 1839(3) could be revised by including an additional element, as illustrated below:

[T]he term “trade secret” means all forms and types of financial, business, scientific, technical, economic, or engineering information, including patterns, plans, compilations, program devices, formulas, designs, prototypes, methods, techniques, processes, procedures, programs, or codes, whether tangible or intangible, and whether or how stored, compiled, or memorialized physically, electronically, graphically, photographically, or in writing if—

(A) the owner thereof has taken reasonable measures to keep such information secret; ~~and~~

(B) the information derives independent economic value, actual or potential, from not being generally known to, and not being readily ascertainable through proper means by, another person who can obtain economic value from the disclosure or use of the information; *and*

307. See *id.* at 52.

308. See *id.* at 109.

309. See *id.* at 57–58 (“[P]recaution can reasonably be perceived as *more* scientific than the traditional approach, where alternatives are ignored and there is misplaced confidence in the existing state of knowledge. Precaution favors an ‘extended science,’ with additional transparency in argumentation, acknowledged uncertainties, and an openness to the ongoing revision of knowledge. It is also about *better* science—science that is transdisciplinary and holistic, attentive to ecological complexity; science whose research program retains greater independence from social and economic pressures.”).

310. See *id.* at 113.

311. See *id.*

312. *Id.*

313. See Levine, *supra* note 49, at 191–92.

(C) the information does not endanger public health.³¹⁴

The rationale behind such a change is that ongoing protection of such secrets is contradictory to the underlying policies of trade secret protection: to incentivize innovation, maintain business ethics, and share information with employees and business partners.³¹⁵ Preventing the disclosure of environmental, health, and safety information necessary for informed debate of fundamental public concerns is not what was envisioned when trade secret law originated.³¹⁶ Such protection “was not designed to address questions about access to information for reasons other than commercial competition.”³¹⁷

Of course, the biggest drawback to this plan is that the DTSA is a federal law that does not preempt state trade secret laws.³¹⁸ Thus, companies could still claim trade secrecy under state law. However, in the future, Congress could amend the DTSA regarding preemption, or the Supreme Court might rule that patent law preempts trade secret law in certain cases. As discussed in Part VII, the last time the Court examined this issue was in the 1974 *Kewanee Oil* decision,³¹⁹ a pre-UTSA case in which Ohio had adopted the *Restatement of Torts*’ definition of a trade secret (which required use) and long before Congress revised the Patent Act.³²⁰ Alternatively, states can begin amending their laws in the same manner suggested for the DTSA.

IX. CONCLUSION

Trade secrecy is an important mechanism for protecting investment and maintaining commercial ethics; however, it has also been abused over the years at the cost of public health and safety. Despite numerous attempts, no adequate solution has been implemented. However, if trade secret law were to incorporate the precautionary principle, then that would properly maintain the balance between the owner’s assets and the public health.

314. See 18 U.S.C. § 1839(3) (2018) (alterations added).

315. See *Kewanee Oil Co. v. Bicron Corp.*, 416 U.S. 470, 481–82, 486 (1974).

316. See Letter to Alaska Oil, *supra* note 285, at 6.

317. *Id.*

318. See 18 U.S.C. § 1838.

319. See generally *Kewanee Oil*, 416 U.S. at 470.

320. *Id.* at 474.